

Instructions for Completion of SF-LLL, Disclosure of Lobbying Activities

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first

subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in Item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.

12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.

13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.

14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.

15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.

16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

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Part VI

Department of Health and Human Services

Food and Drug Administration

21 CFR Part 179

**Irradiation in the Production, Processing,
and Handling of Food; Final Rule**

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 179

[Docket Nos. 86F-0507 and 86F-0509]

Irradiation in the Production, Processing and Handling of Food

AGENCY: Food and Drug Administration, HHS.

ACTION: Final rule.

SUMMARY: The Food and Drug Administration (FDA) is amending the food additive regulations to provide for the safe use of sources of ionizing radiation for the control of food-borne pathogens in poultry. This action is in response to petitions filed by Radiation Technology, Inc., and the U.S. Department of Agriculture, Food Safety and Inspection Service (FSIS).

DATES: Effective May 2, 1990; written objections and requests for a hearing by June 1, 1990.

ADDRESSES: Written objections may be sent to the Dockets Management Branch (HFA-305), Food and Drug Administration, Rm. 4-62, 5600 Fishers Lane, Rockville, MD 20857.

FOR FURTHER INFORMATION CONTACT: Laura M. Tarantino, Center for Food Safety and Applied Nutrition (HFF-330), Food and Drug Administration, 200 C St. SW., Washington, DC 20204, 202-472-5740.

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I. Introduction

In a notice published in the *Federal Register* of February 20, 1987 (52 FR

5343), FDA announced that a food additive petition (FAP 7M3974) had been filed by the U.S. Department of Agriculture, Food Safety and Inspection Service, Washington, DC 20250, proposing that § 179.26 *Ionizing radiation for the treatment of food* (21 CFR 179.26) be amended to provide for the safe use of sources of ionizing radiation (gamma radiation, electron radiation, and X-radiation) to control food-borne pathogens by reducing the amount of microorganisms, such as *Salmonella*, *Yersinia*, and *Campylobacter*, in poultry products.

In a notice published in the *Federal Register* of March 3, 1987 (52 FR 6391), FDA announced that a food additive petition (FAP 8M3422) had been filed by Radiation Technology, Inc., 108 Lake Denmark Rd., Rockaway, NJ 07866, proposing that § 179.26 be amended to provide for the safe use of a source of gamma radiation to irradiate poultry for the purpose of extending shelf-life and reducing the risk of salmonella poisoning.

In recent years, there has been a heightened awareness of the threat to public health from food-borne illnesses caused by pathogens, and in particular those caused by *Salmonella*, on chicken and other poultry. The subject petitions request that FDA amend the food additive regulations to provide for the use of ionizing radiation to treat fresh or frozen, uncooked poultry to reduce the number of illness-causing microorganisms on the food.

In this final rule, the agency is adding to the authorized uses of ionizing radiation the treatment of fresh or frozen, uncooked poultry products that are: (1) Whole carcasses or disjointed portions of such carcasses that are "ready-to-cook poultry" within the meaning of 9 CFR 381.1(b)(44) or (2) mechanically separated poultry product (a finely comminuted ingredient produced by the mechanical deboning of poultry carcasses or parts of carcasses). The poultry can be irradiated at doses of up to 3 kiloGray (300 kilorad) (one kiloGray (kGy) = 100 kilorad (krad)) for control of food-borne pathogens. The term "poultry," as used in this rule, is defined by FSIS in 9 CFR 381.1(b)(40) (i.e., any domesticated bird, including chickens, turkeys, ducks, geese, or guineas).

II. Determination of Safety

In 1958, Congress amended the Federal Food, Drug, and Cosmetic Act (the act) to prohibit the use of a new food additive until the sponsor establishes its safety, and FDA issues a regulation specifying conditions of safe use. A source of radiation was

specifically defined as a food additive in section 201(s) of the act (21 U.S.C. 321(s)).

Under section 409(c)(3)(A) of the act (21 U.S.C. 348(c)(3)(A)), the so-called "general safety clause" of the statute, a food additive cannot be approved for a particular use unless a fair evaluation of the data available to FDA establishes that the additive is safe for that use. The concept of safety embodied in the Food Additives Amendment of 1958 is explained in the legislative history of the provision: "Safety requires proof of a reasonable certainty that no harm will result from the proposed use of an additive. It does not—and cannot—require proof beyond any possible doubt that no harm will result under any conceivable circumstances." (H. Rept. 2284, 85th Cong., 2d Sess. (1958).)

FDA has incorporated this concept of safety into its food additive regulations. Under 21 CFR 170.3(i), a food additive is "safe" is "there is a reasonable certainty in the minds of competent scientists that the substance is not harmful under the intended conditions of use." The agency reviewed the data and studies submitted in the petitions, as well as the entire record in its files relevant to the safety and wholesomeness of poultry treated with ionizing radiation. In addition, several letters were sent to FDA and FSIS in opposition to the FSIS petition. Most of these letters expressed opposition in general terms and urged FSIS to consider alternatives to reduce the levels of *Salmonella* in poultry. They provided no data or rationale, however, on which to deny these petitions. Those letters that addressed a specific issue are discussed below.

III. Data Summary and Evaluation

The agency evaluated: (1) Toxicity studies on irradiated chicken; (2) reports on the efficacy of the process and on the microbiological safety of the product; and (3) studies of the nutritional adequacy of the product.

A. Toxicity Data

1. Toxicity Studies Submitted in the Petition

The following reports of animal feeding studies with irradiated chicken were submitted in petition FAP 8M3422 to demonstrate safety: An 80-week carcinogenicity study in mice carried out at Bio-Research Laboratories for Atomic Energy of Canada, Ltd., and a series of three feeding studies carried out at Centraal Instituut Voor Voedingsonderzoek (CIVO), The Netherlands. The latter studies consisted of: a multigeneration study in

rats; a chronic study in rats; and a 1-year toxicity study in beagle dogs.

a. *Carcinogenicity study in mice.* The mouse chronic feeding study conducted by Bio-Research Laboratories was reported in summary form. In this study, mice fed diets containing 50 percent by weight of chicken irradiated at 7 kGy (700 krad) or of nonirradiated chicken were compared to mice fed a standard commercial diet or a standard diet containing a known carcinogen. Each experimental group consisted of 100 male and 100 female mice. The authors of the study reported that a variety of internal neoplasms occurred in mice in the control and the experimental groups, but that the incidence and distribution of the tumors in all groups (except that in which the animals were fed a diet containing a known carcinogen) were comparable to values for spontaneously occurring mouse tumors as reported in the literature. The authors stated that " * * * there is nothing in the overall results that suggests a carcinogenic effect in mice of irradiated chicken."

The agency found that interpretation of this study was confounded by high rates of mortality and autolysis. In addition, in the course of its initial review of this study, the agency noted a discrepancy in the numbers presented in two of the study report tables for the incidence of hepatomas in female mice fed irradiated chicken. Specifically, 11 tumors of this type were reported in one table, although data in a second table were consistent with the occurrence of just one such tumor in this group.

Because the data submitted on this mouse study consisted of a summary report without full detail, and because of the discrepancy concerning the incidence of hepatomas, the agency requested the original microslides and individual animal data from the laboratory where the study was conducted. After receiving this information, the agency found that the slides were no longer readable because the mounting medium had deteriorated, and that the testing laboratory had not conducted a complete histopathologic examination. The discrepancy regarding the number of hepatomas, however, was resolved by a letter from the Director General of the Food Directorate of Health and Welfare, Canada (Ref. 1), which stated that an examination of the raw data confirmed that the discrepancy was the result of a typographical error. The correct figure was verified as one hepatoma, a number not significantly different from the numbers noted for this tumor type in female mice fed the stock diet or non irradiated chicken. The agency finds that statistical analysis of

the available data from this study does not raise a concern that irradiated chicken is carcinogenic in mice (Ref. 2). Because of deficiencies in the data, however, the agency is not relying on this study as a primary basis for evaluating the safety of irradiation of poultry.

b. *CIVO rat and dog studies.* The petitioner for FAP 8M3422 also submitted a series of three feeding studies carried out at CIVO.

i. *Multigeneration study in rats.* Rats were fed a control basal diet or a diet containing chicken that had been irradiated at 3 or 6 kGy (300 or 600 krad), or nonirradiated chicken, at a level of 35 percent of the diet. The investigators followed reproductive performance through three successive generations. The authors reported that there were no consistent differences between groups in measured reproduction parameters, such as fertility, number of young per litter, and mortality in utero. Feeding of irradiated chicken did not adversely affect body weight, growth rate, and mortality of offspring.

A 90-day subchronic feeding study was conducted with animals from the second litter of the third generation. The investigators measured body weight, hematologic parameters, and blood and urine chemistry. After sacrifice, gross and microscopic examinations of organs and tissues were carried out. The authors reported that no deaths occurred during the course of the study, and that growth rate, condition, and behavior of the animals were normal. There were no significant changes in blood or urine composition. The authors observed that body weights were increased in the test groups, and that the relative weights of liver and kidneys in male rats fed chicken irradiated at 3 kGy were slightly increased. However, the differences in organ weights were not accompanied by gross or microscopic abnormalities. The authors concluded that chicken irradiated at 3 and 6 kGy " * * * did not evoke any distinct deleterious effects when fed to rats at a dietary level of 35% during four generations."

ii. *Chronic rat study.* A second rat feeding study was conducted at CIVO. In this chronic 2-year study, rats were fed a standard diet or a diet containing nonirradiated or irradiated (3 or 6 kGy) chicken at a level of 35 percent dry matter. Each of the diets was fed to 60 male and 60 female rats. Observations were made of appearance, behavior, mortality, growth, hematologic parameters, and blood and urine chemistries. Extensive gross and

microscopic pathological examinations were carried out.

The authors reported no differences among groups in appearance, behavior, mortality, or growth. Hematologic factors and blood and urine chemistries did not show distinct or consistent changes among groups. All abnormalities observed by gross and microscopic examination of tissues were those considered by the investigators to be related to normal aging of rats, and the type and incidence of the changes were comparable in test and control groups. There was no indication that the feeding or irradiated chicken induced neoplasms.

iii. *Beagle study.* In the third CIVO feeding study, beagle dogs were fed a standard diet or a diet containing 35 percent nonirradiated or irradiated (3 to 6 kGy) chicken for 1 year. Each group of dogs consisted of four males and four females. The authors reported that health, survival, appearance, behavior, and growth of the animals were not noticeably affected by inclusion of irradiated chicken in the diet. They found no evidence of abnormalities in hematologic factors, organ weights, or gross and microscopic appearance of organs and tissues and concluded that the feeding of irradiated chicken did not induce any deleterious effects in the dogs.

iv. *FDA's evaluation of the CIVO studies.* Upon evaluation of these feeding studies conducted at CIVO, agency scientists found that the studies appeared to be of high quality and that there was no evidence of adverse effects attributable to consumption of diets containing chicken irradiated at 3 or 6 kGy (Refs. 3 and 4). However, FDA examined the possibility that the addition of ethoxyquin, an antioxidant that was incorporated into the animals' food to inhibit rancidity, could have confounded the interpretation of this series of tests.

The laboratory investigators had noted that lipid peroxide values (a measure of rancidity) increased in chicken as a function of both storage time and irradiation. Thus, the investigators added ethoxyquin to the chicken to prevent development of rancidity in the chicken fat. Ethoxyquin was incorporated into both the control diets and the test diets to control for possible confounding effects. Nonetheless, the agency considered whether ethoxyquin could have decreased the ability of the studies to show a carcinogenic effect because dietary ethoxyquin and other antioxidants have been reported to inhibit the carcinogenic effects of

certain carcinogenic chemicals under some conditions (Ref. 5). The agency also considered the question of whether ethoxyquin might have altered the chemical changes that might occur during the irradiation process.¹

The agency found that the level of ethoxyquin used in the study (35 parts per million (ppm) of diet) was much lower than the level shown to inhibit chemical carcinogenesis (around 10,000 ppm). Further, agency scientists concluded that ethoxyquin is unlikely to significantly alter the level and kind of radiolytic products because the ethoxyquin was not added to the chicken meat until after irradiation (for further discussion, see Ref. 4). Therefore, the agency concluded that the use of ethoxyquin did not confound the results of these studies.

To ensure that all available data relating to these three feeding studies had been evaluated, the agency requested and received necropsy and histopathology data on the individual animals. Review of these data supported the agency's finding (Refs. 3 and 4) that these studies were well-conducted, and that they provide no evidence of treatment-related adverse toxicological effects (Refs. 6 and 7).

2. Other Toxicity Studies in Agency Files

Even though the studies submitted in the petitions and discussed above were adequate to establish that the irradiation of poultry under the conditions specified in the regulation below does not present a toxicological hazard, the agency also evaluated the other available studies of irradiated chicken in its files.

a. Raltech studies. A series of U.S. Department of Agriculture-sponsored studies using chicken sterilized by irradiation was conducted by Raltech Scientific Services. The studies included a chronic feeding study in mice, a chronic feeding study in dogs, teratology studies in four species, a dominant lethal test in mice, a sex-linked recessive test in *Drosophila melanogaster*, and an Ames mutagenicity test. (Reports of these studies are available through the

National Technical Information Service (see 49 FR 40623; October 17, 1984).) The Raltech studies were carried out with chicken that had been thermally processed to inactivate enzymes, cooled to approximately -40 °C, and irradiated in the frozen state in the absence of air at doses ranging from 45 to 59 kGy, some 15 to 20 times the maximum dose at issue in this rulemaking.

The agency discussed the findings of, and its conclusions regarding, the Raltech chronic feeding studies in mice and dogs, an incomplete study in rats, and the sex-linked recessive study in *Drosophila* in its recent decisions on irradiated foods on April 18, 1986 (51 FR 13376 at 13386), and December 30, 1988 (53 FR 53176 at 53188 through 53189). (See also Ref. 8.) Those discussions are incorporated herein.²

The teratology studies conducted at Raltech showed that feeding irradiated chicken to hamsters, rabbits, rats, and mice did not result in teratogenic effects in offspring. The agency's review found that the first three of these studies were of good quality. The agency stated that the study in mice, although negative, was of limited value because of

² Briefly, the agency responded to comments and objections alleging that several of the Raltech studies showed adverse toxicological effects attributable to the feeding of radiation-sterilized chicken. Specifically, the comments and objections raised questions concerning the mutagenicity test in *Drosophila* and feeding studies in mice, dogs, and rats.

There was no evidence that radiation-sterilized chicken is mutagenic in the sex-linked recessive lethal study in *Drosophila*. The agency addressed an observation in this study of decreased numbers of offspring in groups raised on irradiated chicken meat. The agency noted that decreased numbers of offspring also occurred in those groups fed nonirradiated chicken, compared to those fed a control diet, and found that there was no evidence to show that radiation sterilization of chicken caused adverse reproductive effects in this test.

The agency also considered whether the Raltech feeding study in mice showed a treatment-related increase in testicular tumors. Agency scientists examined the histopathology slides from this study. The data were also referred to the National Toxicology Program's (NTP) Board of Scientific Counselors for peer review. FDA and NTP pathologists agreed that the evidence did not show a treatment-related induction of testicular tumors.

With regard to the Raltech dogs feeding study, the agency considered a comment that male dogs fed irradiated chicken had lower body weights than dogs fed frozen chicken. The agency noted, however, that the amount of food made available to the dogs was manipulated to obtain "ideal" body weights and concluded that any difference in body weights was not the result of radiation treatment.

Finally, the agency considered an objection that pointed to the fact that a chronic feeding study in rats was not completed. The rat feeding study was not completed because of lactation failure in parent females in all diet groups, including control groups. Thus, this study was not evaluated by the agency. The authors of the study reported that there was no evidence of toxicity from the test diets during the 9 months of the test.

procedural flaws in recording the data (Ref. 8).

The dominant lethal test in mice did not show adverse effects in animals fed irradiated chicken; however, FDA considered that study to be unsuitable for supporting safety because the positive control also produced negative results (Ref. 8). FDA found that the Ames mutagenicity test was well-conducted and provided no evidence of mutagenicity of irradiated chicken (Ref. 8).

The agency found no evidence in any of the Raltech studies of adverse effects that could be attributed to irradiation of chicken at doses of up to 59 kGy (Ref. 8). Because of differences in irradiation conditions, the radiation-sterilized chicken used in these studies does not model the changes that would be expected in chicken irradiated unfrozen and in the presence of air. Therefore, FDA is not relying on these studies as a primary basis for a safety evaluation. However, the agency finds that the lack of treatment-related adverse effects in the Raltech studies is consistent with the agency's conclusion that chicken irradiated at 3 kGy does not present a toxicological hazard.

b. Genetic toxicity studies. The agency also reviewed several in vitro and in vivo mutagenesis and genetic toxicity studies with irradiated chicken that were carried out at the Federal Research Centre for Nutrition, Karlsruhe, Federal Republic of Germany. These included: a reverse mutation test in *Salmonella typhimurium*; a sister chromatid exchange and hypoxanthine-guanine phosphoribosyl transferase mutation assay in cultured Chinese hamster ovary cells; and a micronucleus test, bone marrow sister chromatid exchange, and sister chromatid exchange in spermatogonia, all in rodents. The investigators reported that chicken irradiated at 7 kGy was not mutagenic in these tests.

The agency found that the tests in rodents (i.e., bone marrow micronucleus tests in rats, mice, and hamsters; sister chromatid exchange in bone marrow cells of mice and hamsters; and sister chromatid exchange in spermatogonia of mice) showed that animals fed irradiated chicken had numbers of micronuclei or sister chromatid exchanges in the tissues examined comparable to those fed nonirradiated chicken. The agency found that these studies demonstrate the lack of mutagenic effects from the irradiated chicken diet (Ref. 8).

Agency scientists noted that methodological deficiencies in the other

¹ In 1982, FDA reviewed all available toxicological studies with irradiated food. The agency concluded that the data were inadequate to support a decision that all foods may be irradiated safely at doses up to 10 kGy (see 51 FR 13376 at 13378 and 13394; April 18, 1986). Agency scientists concluded at that time that the reports of the CIVO studies were not completely acceptable for evaluating the safety of all foods irradiated at doses of up to 10 kGy because of a reservation about the use of ethoxyquin. The agency had not yet made its determination, which is set forth infra, about the significance of the use of this substance.

studies limited their usefulness; however, these scientists found no evidence in any of these studies that indicated that irradiated chicken was mutagenic (Ref. 8).

3. Summary of Toxicological Findings

The agency has carefully reviewed the studies submitted with the petitions and the other available data and studies in its files on the toxicological effects of irradiated chicken. Adverse effects that were attributable to the consumption of irradiated chicken were not produced in any of these studies. While, as noted above, the agency found certain deficiencies in some of the studies, the agency concludes, based on all the evidence before it, that the irradiation of poultry at the petitioned level of up to 3 kGy does not present a toxicological hazard.³

B. Microbiological Considerations

1. Efficacy

The petitioners provided several reports and published papers describing the effectiveness of low-dose irradiation in reducing the number of microorganisms on poultry and other foods. For example, a number of reports submitted in the petitions point out that the radiation dose necessary to reduce the initial population of *Salmonella* by 90 percent (i.e., the D value) ranges from less than 0.5 kGy to approximately 1 kGy depending on such factors as the strain and the temperature at which irradiation is carried out (see, e.g., Ref. 10 for D values obtained under various conditions). Other microorganisms of potential public health significance, specifically *Yersinia* and *Campylobacter*, are even more radiation-sensitive than *Salmonella* (Refs. 11 and 12).

The agency has reviewed these as well as other published data and finds that irradiation at doses of up to 3 kGy (300 krad) is effective in lowering the burden of microorganisms in poultry. In particular, irradiation at these doses is effective in reducing the numbers of such food-borne pathogens as *Salmonella*, *Yersinia*, and *Campylobacter* (Ref. 13).

2. Selective Destruction of Microorganisms

The doses of radiation requested in these petitions do not sterilize the food. Thus, poultry treated in this way would require refrigeration and proper handling by the retailer and consumer to inhibit multiplication of surviving organisms. While irradiation at a dose of 3 kGy reduces the number of many pathogenic and spoilage bacteria, it does not eliminate the relatively radiation-resistant spore-forming bacteria such as *Clostridium botulinum*. *C. botulinum*, however, does not ordinarily grow and produce toxin under the refrigeration conditions that should be used to store fresh poultry. Nevertheless, the agency considered whether *C. botulinum* could grow and produce toxin without the signs of spoilage familiar to the consumer if proper temperature control were not maintained.

FDA reviewed studies in which chicken skins were inoculated with large numbers of *C. botulinum*, irradiated, and stored at a temperature of 10 °C, to model poor refrigeration conditions, and 30 °C, to model a severe abuse temperature. These conditions were chosen to provide a worst-case scenario that would result in a much greater burden of toxin than would be expected under normal conditions.

In one series of studies (Refs. 14 to 16), chicken skins were inoculated with *C. botulinum* Type E, irradiated, incubated at 10 °C or 30 °C, and checked daily for off-odors indicative of spoilage and for toxin production.⁴ The authors noted that irradiation appeared to injure spores of *C. botulinum* because spores on chicken skins irradiated at 3 kGy and held at 10 °C did not produce toxin at any time in the period studied, whereas toxin was produced on the nonirradiated chicken. After storage at 30 °C, toxin was produced on both irradiated and nonirradiated chicken. However, under all storage conditions, even those most

favorable to toxin production, the natural flora surviving 3 kGy irradiation produced off-odors characteristic of spoilage before toxin was observed.

Another study examined the effect of 3 kGy irradiation on the growth of, and toxin production by, *C. botulinum* Types A and B on chicken skins (Ref. 17). The investigators reported that toxin was not formed from these varieties when the chicken was stored at 10 °C, whether irradiated or not. At the abuse temperature of 30 °C, toxin was formed in both irradiated and nonirradiated chicken, but toxin formation was delayed in the chicken subjected to irradiation. In this case also, the natural flora multiplied and produced an off-odor indicative of spoilage by the time samples became toxic.

Thus, these studies show that enough of the normal flora survives in poultry irradiated at 3 kGy (300 krad) that *C. botulinum*, if present, would not render the product toxic before the normal signs of spoilage became evident. Based on this evidence, the agency concludes that irradiation of poultry at 3 kGy does not result in any additional health hazard from *C. botulinum* (Ref. 13).

A letter to the agency contended that the irradiation process can accelerate the growth of *C. botulinum* at doses above 1 kGy (100 krad) and submitted copies of three reports on the irradiation of chicken skins inoculated with *C. botulinum* Type E.

The reports submitted with the comment were those discussed above (Refs. 14 to 16) that showed that no toxin was detected in the irradiated chicken before it spoiled. One of these reports (Ref. 16) described injury to *C. botulinum* spores caused by irradiation at doses of 1 to 4 kGy (100 to 400 krad), as well as repair of such injury. The other two reports (Refs. 14 and 15) concluded that: (1) No toxin was detected before spoilage occurred in chicken irradiated at a dose of 3 kGy, and (2) natural surviving microflora grew faster than *C. botulinum* spores. Thus, contrary to the assertion in the letter, these studies demonstrate that irradiation of chicken at a dose of 3 kGy or less will not result in any additional health hazard from *C. botulinum* Type E. As discussed above, comparable studies have also been conducted with *C. botulinum* Types A and B.

The FSIS petition requested that the packaging used for irradiated chicken be restricted to materials that are oxygen permeable. Packaging and storage of chicken under anaerobic conditions, such as vacuum or modified atmosphere packaging, can extend shelf-life by inhibiting outgrowth of aerobic spoilage

³ In 1979, FDA established the Bureau of Foods Irradiated Food Committee (BFIFC) to review the existing agency policy concerning irradiation of foods (Ref. 9). BFIFC was charged to recommend "toxicologic [testing] requirements appropriate for assessing the safety of irradiated food" BFIFC concluded that foods irradiated at doses above 1 kGy and comprising more than 0.01 percent of the diet warrant toxicologic evaluation. BFIFC recommended that foods irradiated at doses above 1 kGy be evaluated using a battery of mutagenicity tests, as well as 90-day feeding studies in two species (one rodent, one nonrodent), and that the rodent test include in utero exposure.

Among the studies of irradiated chicken that were evaluated by the agency were a battery of in vivo mutagenicity tests that FDA determined to be adequate to demonstrate safety. In addition, FDA reviewed a multigeneration study in rats (including a 90-day subchronic feeding study), a chronic carcinogenicity study in rats, and a 1 year feeding study in dogs and found them to be adequate to demonstrate the toxicological safety of the use of irradiation on poultry at the dose levels at issue in this regulation.

⁴ Although *C. botulinum* Type E is associated primarily with marine products, its response to radiation was studied because chickens may be fed fish meal containing *C. botulinum* Type E, and thus it is conceivable that the intestinal tract of poultry may contain these organisms. Further, *C. botulinum* Type E will multiply and produce toxin at lower temperatures than other types of *C. botulinum*.

microorganisms, but it can also provide conditions conducive to growth of *C. botulinum*. The agency notes that the studies cited above examined *C. botulinum* toxin production and spoilage in chicken incubated both aerobically and anaerobically and found that spoilage preceded toxin production even in chicken incubated anaerobically. Use of air-permeable packaging materials does, however, provide an extra margin of safety. Because the petitioner requested that only air-permeable packaging be permitted, FDA is including a provision in the regulation that packaging used shall not exclude oxygen.

C. Nutritional Considerations

FDA reviewed data to determine whether irradiation of poultry would have an adverse effect on the nutritional value of the food. One study submitted in FAP 8M3422, carried out at CIVO, examined the composition and nutritive value of chicken irradiated at a dose of 3 or 6 kGy (300 or 600 krad), as compared to a nonirradiated control. Batches of irradiated and nonirradiated chicken were refrigerated for 3 to 7 days, cooked, and homogenized. Samples were then analyzed for general composition and content of nutrients, including vitamins. The investigators also performed bioassays of protein utilization and digestibility in weanling rats.

The authors reported that vitamin content showed considerable variation both between different batches of chicken and between different treatments of the same batch. They reported that there was, however, no distinct effect of irradiation on vitamin content, with the possible exception of a slight decrease in vitamin B₁ (thiamin) at a dose of 6 kGy (twice as high as the maximum dose under consideration in this rulemaking). They also reported that determinations of the digestibility and of the utilization of the chicken protein for growth and synthesis of body protein revealed that irradiation did not decrease the nutritive value of protein in weanling rats.

The agency has also received reports of a study conducted at the U.S. Department of Agriculture on the effects of irradiation on nutrients in chicken and pork (Refs. 18 and 19). The authors reported that the levels of niacin and riboflavin did not change significantly with radiation doses of up to 7 kGy in samples of chicken that had been irradiated and then cooked, when compared to control samples that had only been cooked. The loss of thiamin in chicken irradiated in an air-permeable package at 0 °C at a dose of 3 kGy was 9

percent (Ref. 19). The authors of this study considered the effect on the dietary intake of thiamin if all chicken and turkey consumed were irradiated at 3 kGy and estimated that the maximal loss of thiamin in the diet would be 0.076 percent (Ref. 18).

After reviewing these reports and the studies submitted in the petitions in which irradiated chicken was fed to laboratory animals, FDA concludes that the data show that irradiation at the doses used does not have a deleterious effect on the levels or the bioavailability of the nutrients in chicken (Refs. 20 to 22).

One letter to the agency suggested that studies on vitamin losses in irradiated chicken should include comparisons of immediate losses, losses from storage, and losses from cooking.

The analysis of vitamins in the CIVO study discussed above was performed on chicken that had been stored in a refrigerator and cooked, and the USDA study (Ref. 18) explicitly considered the effect of irradiation on vitamin content in both raw and cooked chicken. Thus, FDA has considered the factors cited by the comment and has found no evidence of significant vitamin loss in chicken irradiated to a maximum dose of 3 kGy. The agency therefore concludes that irradiation of poultry at doses of up to 3 kGy will not have an adverse impact on the nutritional value of a person's diet.

IV. Current Good Manufacturing Practice Considerations

FDA has established general provisions defining current good manufacturing practice for the use of irradiation in the treatment of food in § 179.25 (21 CFR 179.25). This regulation discusses requirements such as recordkeeping and the need for a scheduled process for food irradiation. Section 179.25(b) states that: "Food treated with ionizing radiation shall receive the minimum radiation dose reasonably required to accomplish its intended effect * * *." Section 179.25(c) states that: "Packaging materials subjected to irradiation incidental to the radiation treatment and processing of prepackaged foods shall comply with § 179.45."

FSIS, in its petition, requested that FDA establish a minimum dose of 150 krad (1.5 kGy) for the irradiation of poultry and also requested that FDA require that poultry that is to be irradiated be prepackaged.

The minimum dose needed to control pathogenic organisms on poultry can vary with the particular microorganism and with the microbial burden on the food. The need for packaging before application of radiation also may vary

with the intended effect of the treatment and the conditions of application. FSIS, based on its regulatory authority over operation of poultry processing plants, can establish specific packaging requirements and a minimum dose, consistent with current good manufacturing practice, for controlling pathogenic organisms in such plants. FDA concludes that FSIS should be free to do so without having to submit a new petition for an amendment to the regulation as long as any requirements comply with 21 CFR 179.25 and 179.26. Therefore, the regulation set forth below does not establish specific requirements for packaging or for a minimum dose.

V. Labeling

Food irradiated under the conditions of the regulation set forth below must be labeled as required by § 179.26(c) (21 CFR 179.26(c)). In addition, because poultry is also subject to regulation by FSIS, the labeling of poultry irradiated under the conditions of this regulation must comply with any requirements imposed by that agency under its authority to approve labeling of meat and poultry.

VI. Comment

The agency received a letter from two state legislators, dated February 22, 1988 (Ref. 23), asking FDA to deny these petitions and to rescind all regulations permitting sale of irradiated food. This request was based on the legislators' understanding: (1) That benzene is formed in all food when it is irradiated, and (2) that the Delaney Clause of the Federal Food, Drug, and Cosmetic Act prohibits the use of any food additive that is carcinogenic, regardless of the level at which it is present in food.

This letter did not provide any evidence that benzene is formed by irradiation of poultry at a dose of 3 kGy (300 krad) or less, or that if it is formed, it could be expected to be present in amounts that would pose a risk to consumers. FDA denied this request by a letter dated May 2, 1988 (Refs. 24 and 25), because there is no basis for concluding that benzene would be formed in irradiated poultry in toxicologically significant amounts, and because the Delaney Clause applies only to additives, not to impurities that may result in insignificant amounts from the use of additives. The request provided no evidence that increased concentrations of benzene have been, or could be, detected in poultry irradiated at a dose of 3 kGy or less. No further information was submitted to FDA after it denied this request. Therefore, the

request provided no basis for denying these petitions.

Moreover, FDA discussed the possible formation of benzene in its response to objections to FDA's earlier decisions to permit other applications of radiation in food (53 FR 53176 at 53197; December 30, 1988). In that document FDA discussed data demonstrating that very low concentrations of benzene (19 parts per billion) were produced by high dose (56 kGy) radiation sterilization of beef. FDA noted that an analysis by expert scientists found that such low concentrations were of trivial health concern, and that other foods irradiated at lower doses would present even less reason for concern (53 FR 53197).

VII. Conclusions

FDA has evaluated the information submitted in the petitions and other relevant material in its files. Based on these data, the agency concludes that the proposed use of ionizing radiation is safe, and that the regulations should be amended in 21 CFR 179.26(b) as set forth below. The agency is also making minor editorial changes in § 179.26(b) by numbering the entries and by spelling out in full the units of radiation dose.

In accordance with § 171.1(h) (21 CFR 171.1(h)), the petitions and the documents that FDA considered and relied upon in reaching its decision to approve the petitions are available for inspection at the Center for Food Safety and Applied Nutrition by appointment with the information contact person listed above. As provided in 21 CFR 171.1(h), the agency will delete from the documents any materials that are not available for public disclosure before making the documents available for inspection.

The agency has carefully considered the potential environmental effects of this action. FDA had concluded that the action will not have a significant impact on the human environment, and that an environmental impact statement is not required. The agency's finding of no significant impact and the evidence supporting that finding, contained in an environmental assessment, may be seen in the Dockets Management Branch (address above) between 9 a.m. and 4 p.m., Monday through Friday.

VIII. References

The following references have been placed on display in the Dockets Management Branch (address above) and may be seen by interested persons between 9 a.m. and 4 p.m., Monday through Friday.

1. Letter dated January 9, 1987, from S.W. Gunner, Health and Welfare, Canada, to Sanford A. Miller, FDA.

2. Memorandum dated June 16, 1987, from J.A. Springer, FDA, to W.G. Flamm, FDA.

3. Memorandum dated August 7, 1985, from C. Kokoski, FDA, to C. Takeguchi, FDA.

4. Memorandum of meeting dated August 22, 1985, CFSAN Cancer Assessment Committee.

5. Wattenberg, L.W., "Inhibition of Chemical Carcinogenesis," *Journal of the National Cancer Institute*, 60:11, 1978.

6. Memorandum dated February 11, 1986, from H. Irausquin, FDA, to H. Blumenthal, FDA.

7. Memorandum dated July 14, 1986, from H. Irausquin, FDA, to C. Takeguchi, FDA.

8. Memorandum dated December 14, 1988, from H. Irausquin, FDA, to G. Pauli, FDA.

9. Brunetti, A.P. et al., "Recommendations for Evaluating the Safety of Irradiated Foods," final report prepared for the Director, Bureau of Foods, FDA, July 1980.

10. Mulder, R.W.A.W., "Salmonella Radicidation of Poultry Carcasses," Report 363, Spelderholt Institute for Poultry Research, Beekbergen, The Netherlands, 1982.

11. El-Zawahry, Y.A., and D.B. Rowley, "Radiation Resistance and Injury of *Yersinia enterocolitica*," *Applied and Environmental Microbiology*, 37:50, 1979.

12. Lambert, J.D., and R.B. Maxcy, "Effects of Gamma Radiation on *Campylobacter jejuni*," *Journal of Food Science*, 49:665, 1984.

13. Memorandum dated September 21, 1988, from D.A. Kautter, FDA, to C. Takeguchi, FDA.

14. Firstenberg-Eden, R., D.B. Rowley, and G.E. Shattuck, "Factors Affecting Growth and Toxin Production by *Clostridium botulinum* Type E on Irradiated (0.3 Mrad) Chicken Skins," *Journal of Food Science*, 47:887, 1982.

15. Firstenberg-Eden, R., D.B. Rowley, and G.E. Shattuck, "Competitive Growth of Chicken Skin Microflora and *Clostridium botulinum* Type E after an Irradiation Dose of 0.3 Mrad," *Journal of Food Protection*, 46:12, 1983.

16. Rowley, D.B., R. Firstenberg-Eden, and G.E. Shattuck, "Radiation-Injured *Clostridium botulinum* Type E Spores: Outgrowth and Repair," *Journal of Food Science*, 48:1829, 1983.

17. Dezfulian M., and J.G. Bartlett, "Effect of Irradiation on Growth and Toxicity of *Clostridium botulinum* Types A and B Inoculated onto Chicken Skins," *Applied and Environmental Microbiology*, 53:201, 1987.

18. Fox, J.B., Jr., et al., "Effect of Gamma Irradiation on the B Vitamins of Pork Chops and Chicken Breasts," *International Journal of Radiation Biology*, 55:689, 1989.

19. Anonymous, "Status of Food Safety and Inspection Service Irradiation Activities," U.S. Department of Agriculture, Food Safety and Inspection Service, September 1988.

20. Memorandum dated April 2, 1979, from J.E. Vanderveen, FDA, to Petition Control Branch, FDA.

21. Memorandum dated May 17, 1988, from J.T. Tanner, FDA, to C. Takeguchi, FDA.

22. Memorandum dated February 16, 1989, from J.T. Tanner, FDA, to A. Dennis, FDA.

23. Letter dated February 22, 1988, from J.V. Kelly, and J.H. Dorsey, New Jersey State Legislature, to Frank Young, FDA.

24. Letter dated May 2, 1988, from F. Young, FDA, to J.V. Kelly, New Jersey State Legislature.

25. Letter dated May 2, 1988, from F. Young, FDA, to J.H. Dorsey, New Jersey State Legislature.

IX. Objections

Any person who will be adversely affected by this regulation may at any time on or before June 1, 1990, file with the Dockets Management Branch (address above) written objections thereto. Each objection shall be separately numbered, and each numbered objection shall specify with particularity the provisions of the regulation to which objection is made and the grounds for the objection. Each numbered objection on which a hearing is requested shall specifically so state. Failure to request a hearing for any particular objection shall constitute a waiver of the right to a hearing on that objection. Each numbered objection for which a hearing is requested shall include a detailed description and analysis of the specific factual information intended to be presented in support of the objection in the event that a hearing is held. Failure to include such a description and analysis for any particular objection shall constitute a waiver of the right to a hearing on the objection. Three copies of all documents shall be submitted and shall be identified with the docket number found in brackets in the heading of this document. Any objections received in response to the regulation may be seen in the Dockets Management Branch between 9 a.m. and 4 p.m., Monday through Friday.

List of Subjects in 21 CFR Part 179

Food additives, Food labeling, Food packaging, Radiation protection, Reporting and recordkeeping requirements, Signs and symbols.

Therefore, under the Federal Food, Drug, and Cosmetic Act and under authority delegated to the Commissioner of Food and Drugs, 21 CFR part 179 is amended as follows:

PART 179—IRRADIATION IN THE PRODUCTION, PROCESSING AND HANDLING OF FOOD

1. The authority citation for 21 CFR part 179 continues to read as follows:

Authority: Secs. 201, 402, 403, 409, 703, 704 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321, 342, 343, 348, 373, 374).

2. Section 179.26 is amended by revising the table in paragraph (b) to read as follows:

§ 179.26 Ionizing radiation for the treatment of food.

* * * * *

(b) * * *

Use	Limitations
1. For control of <i>Trichinella spiralis</i> in pork carcasses or fresh, non-heat-processed cuts of pork carcasses.	Minimum dose 0.3 kiloGray (kGy) (30 kilorad (krad)); maximum dose not to exceed 1 kGy (100 krad).
2. For growth and maturation inhibition of fresh foods.	Not to exceed 1 kGy (100 krad).
3. For disinfestation of arthropod pests in food.	Do.
4. For microbial disinfection of dry or dehydrated enzyme preparations (including immobilized enzymes).	Not to exceed 10 kGy (1 megarad (Mrad)).

Use	Limitations
5. For microbial disinfection of the following dry or dehydrated aromatic vegetable substances when used as ingredients in small amounts solely for flavoring or aroma: culinary herbs, seeds, spices, vegetable seasonings that are used to impart flavor but that are not either represented as, or appear to be, a vegetable that is eaten for its own sake, and blends of these aromatic vegetable substances. Turmeric and paprika may also be irradiated when they are to be used as color additives. The blends may contain sodium chloride and minor amounts of dry food ingredients ordinarily used in such blends.	Not to exceed 30 kGy (3 Mrad).

Use	Limitations
6. For control of food-borne pathogens in fresh or frozen, uncooked poultry products that are: (1) Whole carcasses or disjointed portions of such carcasses that are "ready-to-cook poultry" within the meaning of 9 CFR 381.1(b)(44), or (2) mechanically separated poultry product (a finely comminuted ingredient produced by the mechanical deboning of poultry carcasses or parts of carcasses).	Not to exceed 3 kGy (300 krad); any packaging used shall not exclude oxygen.

* * * * *

Dated: April 3, 1990.

Alan L. Hoeting,

Acting Associate Commissioner for Regulatory Affairs.

[FR Doc. 90-10113 Filed 5-1-90; 8:45 am]

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federal register

**Wednesday
May 2, 1990**

Part VII

Department of Transportation

**Research and Special Programs
Administration**

**49 CFR Parts 174, 175, and 177
Revision to Modal Regulations; Notice of
Proposed Rulemaking**

DEPARTMENT OF TRANSPORTATION

49 CFR Parts 174, 175, and 177

(Docket No. HM-181B, Notice No. 90-4)

RIN 2137-AB87

Revisions to Modal Regulations

AGENCY: Research and Special Programs Administration (RSPA), Department of Transportation (DOT).

ACTION: Notice of proposed rulemaking.

SUMMARY: RSPA is proposing revisions to the carrier requirements in 49 CFR parts 174, 175, and 177 of the Hazardous Materials Regulations (HMR) for consistency with a previously published proposed rule, Docket HM-181, Notice 87-4 (52 FR 42772, November 6, 1987), and the International Civil Aviation Organization's (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air. The proposals contained in Docket HM-181, Notice No. 87-4, addressed hazard classification, packaging, and hazard communication. Revisions to modal requirements were not addressed. The intended effect of the revisions proposed herein is to align the current rail, air, and highway requirements in parts 174, 175, and 177 with the proposals previously addressed in Docket HM-181, Notice 87-4. If Docket HM-181 is promulgated in a final rule without corresponding revisions to parts 174, 175, and 177, the ensuing confusion could result in erroneous and uncoordinated application of the modal requirements. This action is necessary to provide for the acceptance and transportation of hazardous materials in a consistent manner.

DATES: Comments must be received on or before July 18, 1990.

ADDRESSES: Address comments to Dockets Unit (DHM-30), Office of Hazardous Materials Transportation, RSPA, U.S. Department of Transportation, Washington, DC 20590-0001. Comments should identify the docket and notice number and be submitted, when possible, in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed, stamped postcard. The Dockets Unit is located in Room 8419 of the Nassif Building, 400 Seventh Street SW., Washington, DC 20590-0001. Office hours are 8:30 am to 5:00 pm Monday through Friday, except public holidays.

FOR FURTHER INFORMATION CONTACT: Beth Romo or Ray Gassaway, Standards Division, Telephone: (202) 366-4488, Office of Hazardous Materials

Transportation, 400 Seventh Street SW., Washington, DC 20590-0001.

SUPPLEMENTARY INFORMATION:

I. Background

On May 5, 1987, RSPA (Research and Special Programs Administration) published a notice of proposed rulemaking (NPRM) (Docket No. HM-181; Notice 87-4) in the *Federal Register* (52 FR 16482) proposing sweeping changes to the HMR (Hazardous Materials Regulations), including the adoption of performance-oriented packaging standards and changes in hazard communication, hazard classification and bulk packaging requirements. The proposed regulatory text of Docket No. HM-181, Notice 87-4, was republished in its entirety on November 6, 1987 (52 FR 42772), in order to make certain corrections and to supplement certain of the proposals contained in the May 5, 1987 publication. Please refer to HM-181, Notice 87-4, for additional background information. RSPA also published in the *Federal Register* under Docket No. HM-181, Notice 87-4, two supplemental NPRMs (Notice 88-7, 53 FR 45868, published November 14, 1988 and Notice 89-5, 54 FR 31158, published July 26, 1989) addressing the classification of gases which are toxic by inhalation.

It has been RSPA's intent to develop complementary rulemakings for each transportation mode in order to harmonize current requirements for the acceptance and transportation of hazardous materials with those proposals set forth in HM-181, Notice 87-4. In this notice, RSPA is proposing to amend parts 174, 175, and 177 by specifying both international and DOT equivalency for hazard classes (international numeric class and division number and the corresponding DOT hazard class), quantities (metric measures and U.S. standard unit equivalents), packagings (packing groups and DOT specifications), and by making certain other conforming changes, such as in section references, to correspond with changes proposed under HM-181, Notice 87-4. We are not proposing in this document to amend 49 CFR part 176, Carriage by Vessel. Revisions to part 176 will be addressed in a forthcoming document which will include the consolidation of requirements for transporting explosives by vessel.

In this notice, we are proposing to amend the Segregation and Separation Charts set forth in §§ 174.81(d) and 177.848(d) for the carriage of hazardous materials by rail and public highway, respectively. The proposed revisions

would be parallel for both surface modes and consistent with the provisions in the International Maritime Dangerous Goods (IMDG) Code and the U.N. Recommendations on the Transport of Dangerous Goods. A new explosives loading and storage table would be added to §§ 174.81 and 177.848 for use when different classification groups of Class 1 (explosive) materials are transported in the same rail car or transport vehicle. An explanation of compatibility groups and classification codes can be found in Table 4.1 of the United Nations Recommendations on the Transport of Dangerous Goods, sixth revised edition.

The proposals in this notice are, for the most part, non-substantive changes to parts 174, 175, and 177. These revisions would incorporate U.N. hazard class and division numbers, metric measures, packaging provisions, and section references. For example, many of the changes proposed in this document entail replacing the existing DOT hazard class (e.g., flammable liquid) with both the new hazard class nomenclature and the current DOT hazard class (e.g., Class 3 (flammable liquid) material). The intent of this proposed action is to provide uniformity and conformance with international standards in a manner consistent with the proposals set forth in HM-181, Notice 87-4. The changes proposed in this notice to amend the modal requirements in parts 174, 175, and 177 would be incorporated into any final rule promulgated under Docket HM-181. The following is a section-by-section summary of the proposed amendments:

Part 174—Carriage by Rail

Throughout 49 CFR part 174, RSPA is proposing to add the international numeric hazard class and division number where appropriate to conform with proposed adoption of the U.N. Recommendations. Metric measures and placard names, as proposed in Docket HM-181, Notice 87-4 (52 FR 42772), would be added to appropriate sections of the part. Other revisions to the part would be as follows:

Section 174.25. The table specifying placard notations and endorsements would be revised for clarity and to include the international numeric hazard class and division numbers. In addition, placard names, as proposed in Docket HM-181, Notice 87-4, would be incorporated.

Section 174.81. The section would be retitled "Segregation of Hazardous Materials". The introductory language and the segregation table in existing § 174.81 would be revised and set forth

in proposed paragraph (d). Paragraph (a) would be removed because the separation of Class 8 (corrosive) materials and Division 1.1 or 1.2 (explosive) materials would be addressed in the proposed segregation table. A new paragraph (a) would be added to provide a statement of the applicability of the section. Current paragraph (b) would be revised and redesignated paragraph (c) to include existing provisions from § 177.848(b), but without the phrase "or any other acidic materials which could release hydrocyanic acid from cyanides", as it is believed any commingling of cyanides or cyanide mixtures with acids or other acidic materials will release hydrocyanic acids. Current paragraph (c) would be removed because the existing requirement would be addressed in the proposed compatibility table for Class 1 (explosive) materials in proposed paragraph (f). Current paragraph (d) would be removed as carboys would no longer be an authorized non-bulk packaging under the provisions of Docket HM-181, Notice 87-4. Paragraph (e) would be removed as provisions regulating smokeless powder for small arms, transported by rail or highway, are addressed in proposed § 173.171 of Docket HM-181, Notice 87-4. Paragraph (f) would be redesignated paragraph (d). A new paragraph (f) would introduce the compatibility table for Class 1 (explosive) materials.

The segregation table instructions would be revised to clarify that its provisions also apply to materials held in storage facilities during the course of transportation. The segregation table would be revised by replacing proper shipping names with U.N. hazard classes or divisions. Segregation of hazardous materials would be required where the letter "X" is located at the intersection of two hazard classes or divisions. The reader will find an index to hazard class definitions in HM-181, Notice 87-4 (52 FR 42772 at 42949). The letter "O" would be added to the instructions and segregation table to indicate separation of classes and divisions of hazardous materials by a minimum distance of 1.2 m or 4 feet in any direction to enhance transportation safety. Segregation of Class 8 (corrosive) liquids from Class 1 (explosive) materials would be addressed in the proposed segregation table. Comments specifically addressing this proposed revision are welcome. An "X" would be added to the segregation table to indicate that segregation among different Class 1 (explosive) materials

would be governed by the compatibility table in paragraph (f) of this section.

Division 1.6 (extremely insensitive explosive) materials and Division 6.1 (poisonous liquids; packing group I only) materials would be added to the segregation table in accordance with the IMDG Code. Segregation of Division 1.6 (extremely insensitive explosive) materials from other Class 1 (explosive) materials would be provided for in the compatibility table for Class 1 (explosive) materials in proposed paragraph (f). For the purposes of the segregation table, Division 6.1 would include only poisonous liquids in Packing Group I, as defined in HM-181, Notice 87-4 (52 FR 42772 at 42961). The segregation requirements for these poisonous liquids would be the same as those proposed for Division 2.3 gases in Packing Group I because of their similar hazards.

New provisions to enhance safety and maintain consistency with the IMDG Code would address the segregation of Class 8 (corrosive) liquids from Division 1.3 (class B) special fireworks or railway torpedoes; Division 1.3 (explosive) materials from Division 2.1 (flammable gas) materials, Class 3 (flammable liquid) materials, Division 4.2 (spontaneously combustible) materials, Division 4.3 (dangerous when wet) materials, Division 5.1 (oxidizer) materials, and Division 5.2 (organic peroxides) materials; and Division 1.5 (very insensitive explosive) materials from all hazard classes and divisions except other Class 1 (explosive) materials.

Footnote (1), currently reserved, would be removed. Footnote (2), regarding co-loading Class 8 (corrosive) liquids with Division 4.1 (flammable solid) materials, or Division 5.1 (oxidizer) materials, would be revised by separating Class 3 (flammable liquid) materials, and Division 5.2 (organic peroxides) materials from Class 8 (corrosive) liquids, as indicated in proposed paragraph (d) of this section. Footnote (3) would be removed as it would be addressed in the proposed compatibility table for Class 1 (explosive) materials in proposed paragraph (f). Footnote (4), regarding Department of Defense (DOD) co-loading exceptions for explosives, would be removed. In proposed paragraphs (e)(4) (i) and (ii), proposed Note A would clarify the existing provisions currently contained in footnote (5), and proposed Note B would require materials identified in the proposed segregation table by the letter "O" to be palletized separately by class or division. Minimum pallet height requirements

have been proposed to mitigate the commingling potential among certain hazardous materials. Footnote (6) would be removed because escort shipments of Class 7 (radioactive) materials and Class 1 (explosive) materials under the direction of the Department of Defense or the Department of Energy are not subject to the HMR under current provisions in existing § 173.7.

A new loading and storage table would be added for use when different compatibility groups of Class 1 (explosive) materials are transported on the same rail car, unless loaded in separate freight containers. An "X" at the intersection of two compatibility groups would indicate that those explosives shall not be carried on the same rail car, unless stowed in separate freight containers mounted on the rail car. In accordance with the U.N. Recommendations on the Transport of Dangerous Goods, Class 1 explosives are considered "compatible" if they can be transported together without significantly increasing either the probability of an accident, or the magnitude of the effects of an accident if one should occur. An explanation of classification codes and compatibility groups can be found in Table 4.1 of the U.N. Recommendations on the Transport of Dangerous Goods, sixth revised edition. With one exception, explosives of the same compatibility group but of different divisions could be transported together, provided that the entire shipment is handled and transported as though it was comprised solely of Class 1 (explosive) materials having the lower division number. For example, a mixed shipment of Division 1.2 (Class A explosive) materials and Division 1.4 (Class C explosive) materials, compatibility group D, would be transported as Division 1.2 (Class A explosive) materials. However, when explosives of Division 1.5, compatibility group D, are transported in the same freight container as explosives of Division 1.2, compatibility group D, the total shipment must be handled and transported as Division 1.1, compatibility group D, consistent with § 4.6.3(b) of the U.N. Recommendations on the Transport of Dangerous Goods. In paragraphs (g)(2)(i) through (iii), Notes 1 and 2 would prescribe additional loading and storage provisions applicable to the transportation of explosives that are consistent with § 5.3 of the IMDG Code, entitled "Separation of goods of Class 1 of different compatibility groups." Note 3 would be an additional loading and storage provision applicable to the transportation of those Class 1

(explosive) materials that have been assigned to compatibility group N.

Subpart D—Handling of Placarded Cars. Subpart D would be revised by adding a new § 174.82, consolidating switching requirements from §§ 174.83, 174.84, and 174.85 into § 174.83, and incorporating the rail car positioning requirements of §§ 174.86 through 174.93 into a new § 174.85. Newly added § 174.85 would contain an introductory paragraph and a chart illustrating proposed train placement requirements. These changes to the current train placement requirements would result in more restrictive train position requirements for Division 2.3 (PG I, Zone A, poisonous gas) and Division 6.1 (PG I, Zone A, poisonous liquid) materials and for Division 1.3 (Class B explosive) materials. The changes would lessen the restrictions on Division 1.1 and 1.2 (Class A explosive) materials, with regard to train positioning next to specially-equipped flat cars in TOFC/COFC and auto carriers. The proposed format of the chart is patterned after a train position chart in the Transportation of Dangerous Goods Regulations, issued by the Government of Canada, as well as charts published in various rail industry timetables and special instructions for the transportation of hazardous materials. RSPA believes the increased clarity of this proposed chart will provide substantial safety benefits. The chart separates hazard classes into Placard Groups based on comparable risks. For example, Placard Group 2 would consist of all Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), and Class 8 (corrosive) materials. Class 1 (explosive), Class 2 (gases), and Class 6 (poisonous) materials would also be included in Placard Group 2, except for explosives in Division 1.1 or 1.2 and poisonous gases or liquids in Division 2.3 (PG I, Zone A) or 6.1 (PG I, Zone A) which pose a greater risk and require additional restrictions. A section by section description of the proposed changes follows:

Section 174.82. General handling requirements for placarded rail cars, transport vehicles, freight containers, and bulk packages would be consolidated into this new section.

Section 174.83. This section would be rewritten to incorporate and clarify the current switching and yard, siding, or side track placement provisions of §§ 174.83 through 174.85.

Section 174.84. This section would replace current § 174.86 and would address train placement of placarded rail cars, transport vehicles, freight containers, and bulk containers, accompanied by guards or technical

escorts. The phrase "temperature control equipment" would replace the phrase "lighted heater or stove" and would consist of automatic refrigerating or heating apparatus in operation, or lighted heaters or stoves.

Section 174.85. An introductory paragraph and a new chart illustrating train placement of rail cars transporting hazardous materials would replace the current section.

Section 174.86. This section would be incorporated into proposed § 174.84.

Sections 174.87 through 174.93. These sections would be incorporated into proposed § 174.85.

Subparts E through M

Section 174.280. The poison label requirement would be replaced by a requirement for a poisonous gas label.

Section 174.290. The reference to DOT packaging would be replaced by reference to the packaging requirements proposed under Docket HM-181, Notice 87-4.

Section 174.300. Current paragraph (d) would be removed and redesignated as new § 174.430. Paragraph (e) would be redesignated paragraph (d).

Section 174.410. The reference to DOT packaging would be replaced by reference to the packaging requirements proposed under Docket HM-181, Notice 87-4.

Section 174.510. The reference to § 173.182(b) would be removed.

Section 174.615. The chemical name for Paris green would be added.

Section 174.800. All references to carboys would be removed.

Section 174.810. The prohibition against the loading and storage of electric storage batteries (wet) with explosives would be removed, as it would be addressed in the Segregation Table in § 174.81. The reference to "§ 173.258" would be changed to "§ 173.159".

Section 174.812. The section, which prescribes special handling requirements for nitric acid in carboys, would be removed. Carboys would no longer be an authorized non-bulk packaging under the provisions of HM-181, Notice 87-4.

Section 174.840. The reference to "§ 173.1090" would be changed to "§ 173.216".

Part 175—Carriage by Aircraft

Throughout 49 CFR part 175, RSPA is proposing to add the international numeric hazard class and division number where appropriate to conform with proposed adoption of the U.N. Recommendations. Metric measures and placard names, as proposed in Docket HM-181, Notice 87-4 (52 FR 42772),

would be added to appropriate sections of the part. Other revisions to the part would be as follows:

Section 175.10. The reference to "§ 173.615(a)" would be revised to read "§ 173.217", and "§ 173.260(d)" would be revised to read "§ 173.159(d)".

Section 175.45. The words "etiologic agent" would be replaced with "etiologic or infectious substance".

Section 175.85. The references to "ICAO" in paragraphs (c)(1)(i), (c)(1)(ii), and (c)(1)(iv) would be removed as they would no longer be necessary, paragraph (c)(1)(iii) and (c)(1)(vii) would be removed, and paragraphs (c)(1)(iv) through (c)(1)(vi) would be redesignated (c)(1)(iii) through (c)(1)(v).

Section 175.90. The words "etiologic agent" would be replaced with "etiologic or infectious substance".

Section 175.305. The reference to "§ 173.120" would be revised to read "§ 173.220".

Section 175.310. The reference to DOT packaging would be replaced by a reference to the packaging proposed under Docket HM-181, Notice 87-4.

Section 175.320. The Table would be revised to clarify that Division 1.4 (Class C) detonators and detonating primers would be permitted aboard the same aircraft as Division 1.1 or 1.2 detonators or detonating primers.

Section 175.630. The label for etiologic agent would be replaced by an infectious substance label.

Section 175.640. The reference to "§ 173.1090" would be revised to read "§ 173.216".

Part 177—Carriage by Public Highway

Throughout 49 CFR part 177, RSPA is proposing to add the international numeric hazard class and division number where appropriate to conform with proposed adoption of the U.N. Recommendations. Metric measures and placard names, as proposed in Docket HM-181, Notice 87-4 (52 FR 42772), would be added to appropriate sections of the part. Other revisions to the part would be as follows:

Section 177.818. The water capacity limit per package for flammable cryogenic liquids would be measured in liters and decreased from 125 gallons to 450 liters (118.9 gallons) to provide consistency with the definitions in existing § 171.8 for bulk and non-bulk packagings.

Section 177.837. Paragraph (d) addressing pyroforic liquids would be removed from this section and added to § 177.838. Paragraph (e) would be redesignated as paragraph (d).

Section 177.838. The reference to DOT packaging would be replaced by a

reference to the packaging proposed under Docket HM-181, Notice 87-4; the reference to § 173.182(b) would be removed; and paragraph (d) of current § 174.837, addressing pyroforic liquids, would be added as new paragraph (h).

Section 177.839. All references to carboys would be removed.

Section 177.840. In paragraph (h), the water capacity limit per package for flammable cryogenic liquids would be measured in liters and decreased from 125 gallons to 450 liters (118.9 gallons) to provide consistency with the definitions in existing § 171.8 for bulk and non-bulk packagings.

Section 177.844. The reference to § 173.1090 would be changed to § 173.216.

Section 177.848. The section would be retitled "Segregation of Hazardous Materials". The introductory language and the segregation table in existing § 177.848 would be revised and set forth in proposed paragraph (d). Paragraph (a) would be removed because the separation of Class 8 (corrosive) materials and Division 1.1 or 1.2 (explosive) materials would be addressed in the proposed segregation table. A new paragraph (a) would be added setting forth the applicability of the section. Current paragraph (b) would be revised and redesignated paragraph (c) to include existing provisions from current § 177.848(b), but without the phrase "any other acidic materials which could release hydrocyanic acid from cyanides", as it is believed any commingling of cyanides or cyanide mixtures with acids or other acidic materials will release hydrocyanic acids. Current paragraph (c) would be removed because the existing requirement is addressed in the proposed compatibility table for Class 1 (explosive) materials in proposed paragraph (f). The current paragraph (d) would be removed as carboys would no longer be an authorized non-bulk packaging under the provisions of Docket HM-181, Notice 87-4. Paragraph (e) would be removed as provisions regulating smokeless powder for small arms, transported by rail or highway, are addressed in proposed § 173.171 of Docket HM-181, Notice 87-4. Paragraph (f) would be redesignated paragraph (d). A new paragraph (f) would be added to introduce the compatibility table for Class 1 (explosive) materials.

The segregation table instructions would be revised to clarify that its provisions also apply to materials held in storage facilities during the course of transportation. The segregation table would be revised by replacing proper shipping names with U.N. hazard classes or divisions. Segregation of

hazardous materials would be required where the letter "X" is located at the intersection of two hazard classes or divisions. The reader will find an index to hazard class definitions in HM-181, Notice 87-4 (52 FR 42772 at 42949). The letter "O" would be added to the instructions and segregation table to indicate separation of classes and divisions of hazardous materials by a minimum distance of 1.2 m or 4 feet in any direction to enhance transportation safety. Segregation of Class 8 (corrosive) liquids from Class 1 (explosive) materials would be addressed in the proposed segregation table. Comments specifically addressing this proposed revision are welcome. An "X" would be added to the segregation table to indicate that segregation among different Class 1 (explosive) materials would be governed by the compatibility table in paragraph (f) of this section.

Division 1.6 (extremely insensitive explosive) materials and Division 6.1 (poisonous liquids; packing group I only) materials would be added to the segregation table in accordance with the IMDG Code. Segregation of Division 1.6 (extremely insensitive explosive) materials from other Class 1 (explosive) materials would be explained in the compatibility table for Class 1 (explosive) materials in proposed paragraph (f). For the purposes of the segregation table, Division 6.1 would include only poisonous liquids in Packing Group I, as defined in HM-181, Notice 87-4. The segregation requirements for these poisonous liquids would be the same as those proposed for Division 2.3 gases in Packing Group I because of their similar hazards.

New provisions to enhance safety and maintain consistency with the IMDG Code would address the segregation of Class 8 (corrosive) liquids from Division 1.3 (class B) special fireworks or railway torpedoes; Division 1.3 (explosive) materials from Division 2.1 (flammable gas) materials, Class 3 (flammable liquid) materials, Division 4.2 (spontaneously combustible) materials, Division 4.3 (dangerous when wet) materials, Division 5.1 (oxidizer) materials, and Division 5.2 (organic peroxides) materials; and Division 1.5 (very insensitive explosive) materials from all hazard classes and divisions except other Class 1 (explosive) materials.

Footnote (1), regarding the segregation of Class 1 (explosive) materials, would be removed and addressed in the proposed compatibility table for Class 1 (explosive) materials. Footnote (2), regarding co-loading Class 8 (corrosive) liquids with Division 4.1 (flammable solid) materials, or Division 5.1

(oxidizer) materials, would be revised by separating Class 3 (flammable liquid) materials, and Division 5.2 (organic peroxides) materials from Class 8 (corrosive) liquids, as indicated in proposed paragraph (d) of this section. Footnote (3) would be removed as it would be addressed in the proposed compatibility table for Class 1 (explosive) materials in proposed paragraph (f). Footnote (4), regarding Department of Defense co-loading exceptions for explosives, would be removed. In proposed paragraphs (e)(4) (i) and (ii), Note A would clarify the existing provisions currently contained in footnote (5), and Note B would require materials identified in the proposed segregation table by the letter "O" to be palletized separately by class or division. Minimum pallet height requirements have been proposed to mitigate the commingling potential among certain hazardous materials. Footnote (6) would be removed because escort shipments of Class 7 (radioactive) materials and Class 1 (explosive) materials under the direction of the Department of Defense or the Department of Energy are not subject to the HMR under current provisions in existing § 173.7.

A new loading and storage table would be added in proposed paragraph (f) for use when different compatibility groups of Class 1 (explosive) materials are transported in the same transport vehicle. An "X" at the intersection of two compatibility groups would indicate that those explosives shall not be carried in the same transport vehicle. In accordance with the U.N. Recommendations on the Transport of Dangerous Goods, Class 1 explosives are considered "compatible" if they can be transported together without significantly increasing either the probability of an accident, or the magnitude of the effects of an accident if one should occur. An explanation of classification codes and compatibility groups can be found in Table 4.1 of the United Nations Recommendations on the Transport of Dangerous Goods, sixth revised edition. With one exception, explosives of the same compatibility group but different divisions could be transported together, provided that the entire shipment is handled and transported as though it is comprised solely of Class 1 (explosive) materials having the lower division number. For example, a mixed shipment of Division 1.2 (Class A explosive) materials and Division 1.4 (Class C explosive) materials, compatibility group D, would be transported as Division 1.2 (Class A explosive) materials. However, when

explosives of Division 1.5, compatibility group D, are transported in the same freight container as explosives of Division 1.2, compatibility group D, the total shipment must be handled and transported as Division 1.1, compatibility group D. This is consistent with section 4.6.3(b) of the U.N. Recommendations on the Transport of Dangerous Goods.

In paragraphs (g)(2) (i) through (iii), Notes 1 and 2 would prescribe additional loading and storage provisions applicable to the transportation of explosives that are consistent with section 5.3 of the IMDG Code, entitled "Separation of goods of Class 1 of different compatibility groups." Note 3 would be an additional loading and storage provision applicable to the transportation of those Class 1 (explosive) materials that have been assigned to compatibility group N.

II. Administrative Notices

A. Executive Order 12291

The RSPA has determined that this rulemaking: (1) is not "major" under Executive Order 12291; (2) is not "significant" under DOT's regulatory policies and procedures (44 FR 11034); (3) will not affect not-for-profit enterprises or small governmental jurisdictions; and (4) does not require an environmental impact statement under the National Environmental Policy Act (40 U.S.C. 4321 *et seq.*). A regulatory evaluation is available for review in the docket.

B. Executive Order 12612

This proposed action has been analyzed in accordance with the principles and criteria in Executive Order 12612, and it has been determined that the proposed rule does not have sufficient Federalism implications to warrant the preparation of a Federalism Assessment. This proposal has no substantial direct impact on the States, on the Federal-State relationship, or on the distribution of power and responsibilities among levels of government. Therefore, this proposed rulemaking contains no policies with

Federalism implications as defined in Executive Order 12612.

C. Regulatory Flexibility Act

The proposed changes to the current modal requirements would generally affect persons involved in the handling, transport, and storage (incident to transportation) of hazardous materials, some of whom may be small entities. The changes would involve becoming familiar with new terminology and would impose little or no cost on those entities. Based on limited information concerning the size and nature of entities likely to be affected by this proposed rule, I certify that the regulations proposed within would not, if promulgated, have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects

49 CFR Part 174

Hazardous materials transportation, Radioactive materials, Railroad safety.

49 CFR Part 175

Air carriers, Hazardous materials transportation, Radioactive materials, Reporting and recordkeeping requirements.

49 CFR Part 177

Hazardous materials transportation, Motor carriers, Radioactive materials, Reporting and recordkeeping requirements.

For the reasons set out in the preamble, Title 49, Chapter I, Subchapter C of the Code of Federal Regulations would be amended as set forth below:

PART 174—CARRIAGE BY RAIL

1. The authority citation for part 174 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1808, 49 CFR 1.53(e), 1.53, App. A to part 1.

§ 174.8 [Amended]

2. In § 174.8, paragraphs (b) and (c), the phrase "Class A explosives" would

be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

§ 174.10 [Amended]

3. In § 174.10, the following changes would be made:

a. In paragraph (a), the phrase "EXPLOSIVES A" would be removed and replaced with the phrase "EXPLOSIVES 1.1 or 1.2 (EXPLOSIVES A)".

b. In paragraph (d), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

§ 174.14 [Amended]

4. In § 174.14, paragraph (b), the phrase "flammable liquid or gas, or a poison gas" would be removed and replaced with the phrase "Division 2.1 (flammable gas), Division 2.3 (poisonous gas) or Class 3 (flammable liquid) material".

§ 174.16 [Amended]

5. In § 174.16, the following changes would be made:

a. In paragraph (a), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

b. In paragraphs (b)(1), (b)(2), and (b)(3), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

§ 174.18 [Amended]

6. In § 174.18, the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" in both places it appears.

7. In § 174.25, paragraph (a)(2), the table would be revised to read as follows:

§ 174.25 Additional information on waybills, switching orders and other billings.

(a) * * *

(2) * * *

Class/Division	Hazardous material	Placard notation	Placard endorsement
Division 1.1 or Division 1.2	Explosives (Class A)	Placarded EXPLOSIVES 1.1 or EXPLOSIVES 1.2	Explosives.
	Explosive chemical ammunition containing Division 2.3 gas.	Placarded EXPLOSIVES 1.1 or EXPLOSIVE 1.2, & POISON GAS.	Explosives and poison gas.
Division 1.3	Explosives (Class B)	Placarded EXPLOSIVES 1.3	Dangerous.
Division 1.4	Explosives (Class C)	Placarded EXPLOSIVES 1.4	Do.
Division 1.5	Blasting Agent	Placarded EXPLOSIVES 1.5	Do.
Division 1.6	N/A	Placarded EXPLOSIVES 1.6	Do.
Division 2.1	Flammable gas	Placarded FLAMMABLE GAS	Do.
Division 2.2	Nonflammable gas	Placarded NONFLAMMABLE GAS	Do.
Division 2.3	Poisonous gas	Placarded POISON GAS	Poison gas.
Class 3	Flammable Liquid	Placarded FLAMMABLE	Dangerous.
Class 3	Combustible Liquid	Placarded COMBUSTIBLE	Do.

Class/Division	Hazardous material	Placard notation	Placard endorsement
Class 4	Flammable solid	Placarded FLAMMABLE SOLID, SPONTANEOUSLY COMBUSTIBLE or DANGEROUS WHEN WET.	Do.
Division 5.1	Oxidizer	Placarded OXIDIZER	Do.
Division 5.2	Organic peroxide	Placarded ORGANIC PEROXIDE	Do.
Division 6.1	Poisonous/Irritating	Placarded POISON	Do.
Class 7	Radioactive material (Yellow-III only)	Placarded RADIOACTIVE	Radioactive material.
Class 8	Corrosive	Placarded CORROSIVE	Dangerous.
Tank cars which contain a residue of a hazardous material other than a combustible liquid.		See Sec. 174.25(c)	Do.
Tank cars which contain a residue of a combustible liquid		See Sec. 174.25(c).	

§ 174.25 [Amended]

8. In § 174.25, the following changes would be made:

a. In § 174.25, paragraph (a)(2)(i), the phrase "3/16 of an inch" would be removed and replaced with the phrase "1 cm (0.4 inch)".

b. In paragraph (a)(2)(ii), the phrase "1/16 of an inch" would be removed and replaced with the phrase ".25 cm (0.1 inch)".

c. In paragraph (c), the phrase "Combustible liquid" would be removed and replaced with the phrase "Class 3".

d. In paragraph (d), the phrase "Explosives A" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials" each place it appears.

§ 174.26 [Amended]

9. In § 174.26, paragraph (a), the phrase "EXPLOSIVE A" would be removed and replaced with the phrase "EXPLOSIVES 1.1 or 1.2 (EXPLOSIVES A)".

§ 174.47 [Amended]

10. In § 174.47, paragraphs (a) and (b), the word "explosives" would be

removed and replaced with the phrase "Class 1 (explosive) materials".

§ 174.49 [Amended]

11. In § 174.49, the phrase "flammable liquids, gases, or vapors" would be removed and replaced with the phrase "Division 2.1 (flammable gas) or Class 3 (flammable liquid) materials or vapors".

§ 174.50 [Amended]

12. In § 174.50 paragraph (d), the phrase "three inches in size" would be removed and replaced with the phrase "7.5 cm (3 inches) in size".

§ 174.67 [Amended]

13. In § 174.67, the following changes would be made:

a. In paragraph (a)(3), the phrase "12 inches high by 15 inches wide" would be removed and replaced with the phrase "30 cm (11.8 inches) high by 38 cm (15 inches) wide", the phrase "4 inches high" would be removed and replaced with the phrase "10 cm (3.9 inches)", and the phrase "2 inches high" would be removed and replaced with the phrase "5 cm (2 inches)".

b. In paragraph (k), the phrase "36 inches long" would be removed and

replaced with the phrase "1 meter (3.3 feet) long".

14. Section 174.81 would be revised to read as follows:

§ 174.81 Segregation of hazardous materials.

(a) This section applies to materials which meet one or more of the hazard classes defined in this subchapter and are in packages which are required to be labeled or placarded under the provisions of part 172 of this subchapter.

(b) In addition to the provisions of paragraph (d) of this section, when a rail car is to be transported by vessel, other than a ferry vessel, hazardous materials on or within that rail car shall be stowed and segregated in accordance with §§ 176.83 and 176.44 of this subchapter.

(c) In addition to the provisions of paragraph (d) of this section, cyanides or cyanide mixtures shall not be loaded or stored with acids.

(d) Hazardous materials shall not be loaded, transported, or stored together, except as provided in this section and in accordance with the following Table.

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gases packing group I only	3	4.1	4.2	4.3	5.1	5.2	6.1 liquids packing group I only	7	8 liquids only
Explosives	1.1 and 1.2 A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Explosives	1.3	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Explosives	1.4	*	*	*	*	*	O	O	O	O	O	O	O	O	O	O	O	O
Very insensitive explosives	1.5	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive explosives	1.6	*	*	*	*	*												
Flammable gases	2.1	X	X	O	X				O			O	O	O	O	O	O	O
Non-toxic, non-flammable gases	2.2	X			X													
Poisonous gases; packing group I only	2.3	X	X	O	X		O			X	X	X	X	X	X			X
Flammable liquids	3 B	X	X	O	X			X			O	O	O	O	O	X		O
Flammable solids	4.1 B	X	X	O	X			X								X		O
Spontaneously combustible materials	4.2	X	X	O	X		O	X		O						X		X
Dangerous when wet materials	4.3	X	X		X		O	X		O					X			X
Oxidizers	5.1 A, B	X	X		X		O	X		O					X			O
Organic peroxides	5.2 B	X	X		X		O	X		O					X			O

SEGREGATION TABLE FOR HAZARDOUS MATERIALS—Continued

Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gases packing group I only	3	4.1	4.2	4.3	5.1	5.2	6.1 liquids packing group I only	7	8 liquids only
Poisonous liquids: packing group I only.	6.1	X	X	O	X		O			X	X	X	X	X	X			X
Radioactive materials.....	7	X			X		O											
Corrosive liquids.....	8 B	X	X	O	X		O	X		O	O	X	X	O	O	X		

(e) Instructions for using the Segregation Table for Hazardous Materials set forth in paragraph (d) of this section are as follows:

(1) The letter "X" in the Table means that these materials shall not be loaded, transported, or stored together in the same rail car or storage facility during the course of transportation.

(2) The letter "O" in the Table means that these materials shall not be loaded, transported, or stored together in the same rail car or storage facility during the course of transportation, unless

separated by a distance of 1.2 m (4 feet) in all directions.

(3) The "X" in the Table means that segregation among different Class 1 (explosive) materials is governed by the Compatibility Table in paragraph (f) of this section.

(4) The notes in the second column of the Table mean the following:

(i) "A" means that ammonium nitrate fertilizer may be loaded or stored with Division 1.1 (Class A explosive) materials.

(ii) "B" means that the materials for which an "O" appears in the Table may be loaded and transported together if each class or division is separately palletized at a minimum height of 10.6 cm (4 inches) off the floor of the rail car and separated by a distance of 1.2 m (4 feet) in all directions.

(f) Class 1 (explosive) materials shall not be loaded, transported, or stored together, except as provided in this section and in accordance with the following Table.

COMPATIBILITY TABLE FOR CLASS 1 (EXPLOSIVE) MATERIALS

Compatibility group	A	B	C	D	E	F	G	H	J	K	L	N	S
A		X	X	X	X	X	X	X	X	X	X	X	X
B	X		X	X	X	X	X	X	X	X	X	X	X
C	X	X		2	2	X	X	X	X	X	X	X	3
D	X	X	2		2	X	X	X	X	X	X	X	3
E	X	X	2	2		X	X	X	X	X	X	X	3
F	X	X	X	X	X		X	X	X	X	X	X	X
G	X	X	X	X	X	X		X	X	X	X	X	X
H	X	X	X	X	X	X	X		X	X	X	X	X
J	X	X	X	X	X	X	X	X		X	X	X	X
K	X	X	X	X	X	X	X	X	X		X	X	X
L	X	X	X	X	X	X	X	X	X	X		X	X
N	X	X	X	X	X	X	X	X	X	X	X		X
S	X	X	3	3	3	X	X	X	X	X	X	X	

(g) Instructions for using the Compatibility Table for class 1 (explosive) materials set forth in paragraph (f) of this section are as follows:

(1) The letter "X" in the Table means that explosives of different compatibility groups shall not be carried on the same rail car, unless packed in separate freight containers (e.g., two or more freight containers mounted upon the same rail car).

(2) The notes in the Table mean the following:

(i) "1" means explosives from compatibility group L shall only be carried on the same rail car with an identical explosive.

(ii) "2" means any combination of explosives from compatibility groups C, D, or E is assigned to compatibility group E.

(iii) "3" means any combination of explosives from compatibility groups C, D, or E with those in compatibility group N is assigned to compatibility group D.

(h) With one exception, explosives of the same compatibility group but of different divisions may be transported together, provided that the whole shipment is handled and transported as though its entire contents were comprised of the lower division. For example, a mixed shipment of Division 1.2 (Class A explosive) materials and Division 1.4 (Class C explosive) materials, compatibility group D, must be handled and transported as Division 1.2 (Class A explosive) materials. However, when Division 1.5 (blasting agent) materials, compatibility group D, are transported in the same freight container as Division 1.2 (Class A explosive) materials, compatibility group D, the shipment must be handled

and transported as Division 1.1 (Class A explosive) materials, compatibility group D.

15. The subpart D heading would be revised to read as follows:

Subpart D—Handling of Placarded Rail Cars, Transport Vehicles and Freight Containers

16. A new § 174.82 would be added to read as follows:

§ 174.82 General requirements for the handling of placarded rail car, transport vehicles, freight containers, and bulk packages.

(a) Unless otherwise specified, this subpart does not apply to the handling of rail cars, transport vehicles, freight containers, or bulk packages, which contain Class 3 combustible liquids, Class 6, Packing Group III materials,

Class 9 materials, or ORM-D or ORM-E materials.

(b) A placarded rail cars, transport vehicle, freight container, or bulk package shall not be transported in a passenger train.

17. Section 174.83 would be revised to read as follows:

§ 174.83 Switching placarded rail cars, transport vehicles, freight containers, and bulk packagings.

(a) (1) A loaded placarded tank car or a draft which includes a loaded placarded tank car may not be cut off until the preceding rail car clears the ladder track.

(2) A loaded placarded tank car or a draft which includes a loaded placarded tank car must clear the ladder track before another rail car is allowed to follow.

(b) A rail car shall not be allowed to move under its own momentum, or be coupled into or struck by any other rail car with more force than is necessary to complete the coupling, when any rail car is:

(1) Placarded in Division 1.1 or 1.2 (Class A Explosives);

(2) A tank car placarded in Division 2.3 (PG I, Zone A; poisonous gas) or 6.1 (PG I, Zone A; poisonous liquid);

(3) A Class DOT 113 tank car transporting a Division 2.1 (flammable gas) material; or

(4) A placarded flatcar, or a flatcar transporting a loaded placarded rail car, transport vehicle, freight container, or bulk packaging.

(c) When transporting a rail car, transport vehicle, or freight container placarded for Division 1.1 or 1.2 (Class A explosive) materials in a terminal, yard, or on a side track or siding, the placarded rail car must be separated from the engine by at least one non-placarded rail car and must be placed in a location so that it will be safe from danger of fire. A rail car, transport vehicle, or freight container placarded for Division 1.1 or 1.2 (Class A explosive) materials shall not be placed under a bridge or overhead crossing, or in or alongside a passenger shed or station, except during transfer operations.

18. Section 174.84 would be revised to read as follows:

§ 174.84 Position in train of loaded placarded rail cars, transport vehicles, freight containers or bulk packagings when accompanied by guards or technical escorts.

A rail car placarded in Division 1.1 or 1.2 (Class A explosive); Division 2.3 (PG I, Zone A; poisonous gas); or Division 6.1 (PG I, Zone A; poisonous liquid) in a moving or standing train must be next to and ahead of any car occupied by the guards or technical escorts

accompanying the placarded rail car. However, if a rail car occupied by the guards or technical escorts has temperature control equipment in operation, it must be the fourth car behind any car requiring Division 1.1 or 1.2 (Class A explosive) placards.

19. Section 174.85 would be revised to read as follows:

§ 174.85 Position in train of placarded cars, transport vehicles, freight containers, and bulk packagings.

(a) Except as provided in paragraphs (b) and (c) of this section, the position in a train of each loaded placarded car, transport vehicle, freight container, and bulk packaging must conform to the provisions of this section.

(b) A car placarded "RADIOACTIVE" must be separated from a locomotive, occupied caboose, or carload of undeveloped film by at least one non-placarded car.

(c) A car placarded "RESIDUE" must be separated from a locomotive or occupied caboose by at least one non-placarded car.

(d) *Position of rail cars in a train.* In the following table:

(1) Where an "X" appears at the intersection of a Placard Group column and a Restriction row, the corresponding restriction applies.

(2) "Rail Car" means a car other than a tank car.

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS

RESTRICTIONS	Placard group 1	Placard group 2		Placard group 3		Placard group 4
	Rail car	Tank car	Rail car	Tank car	Rail car	Rail car
1. When train length permits, placarded car shall not be nearer than the sixth car from the engine or occupied caboose.	X	X		X		
2. When train length does not permit, placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.	X	X		X		
3. An open-top car when any of the lading protrudes beyond the car ends or if shifted would protrude beyond the car ends.	X	X		X		
4. Loaded flat car except closed TOFC/COFC equipment, auto carriers, and other specially-equipped cars with tie-down devices for handling vehicles. Permanent bulk head flat cars are considered the same as open-top cars.	X	X		X		
5. Any car, piggyback, or container with temperature control equipment or internal combustion engine in operation.	X	X		X		
6. Placarded cars shall not be placed next to each other based on the following:						
Placard Group 1.....		X	X	X	X	X
Placard Group 2.....	X			X	X	X
Placard Group 3.....	X	X	X			X
Placard Group 4.....	X	X	X	X	X	

Placard Group:

Group 1—Divisions 1.1 and 1.2 (Class A explosive) materials.

Group 2—Divisions 1.3, 1.4, 1.5 (Class B and C explosive), Class 2 (compressed gas; other than Div 2.3, PG I, Zone A), Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), Class 6 (poisonous liquid; other than Div 6.1, PG I, Zone A), and Class 8 (corrosive) materials.

Group 3—Divisions 2.3 (PG I, Zone A; poisonous gas) and 6.1 (PG I, Zone A; poisonous liquid) materials.

Group 4—Class 7 (corrosive) materials.

§ 174.86 [Removed]

20. Section 174.86 would be removed.

§ 174.87 [Removed]

21. Section 174.87 would be removed.

§ 174.88 [Removed]

22. Section 174.88 would be removed.

§ 174.89 [Removed]

23. Section 174.89 would be removed.

§ 174.90 [Removed]

24. Section 174.90 would be removed.

§ 174.91 [Removed]

25. Section 174.91 would be removed.

§ 174.92 [Removed]

26. Section 174.92 would be removed.

§ 174.93 [Removed]

27. Section 174.93 would be removed.

28. The subpart E heading would be revised to read as follows:

Subpart E—Class 1 (Explosive) Materials

§ 174.100 [Amended]

29. In § 174.100, the following changes would be made:

a. In the section heading and paragraph (b), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

b. In paragraph (a), the word "Explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

c. In paragraph (b), the word "explosive" would be removed and replaced with the phrase "Class 1 (explosive) materials".

§ 174.101 [Amended]

30. In § 174.101, the following changes would be made:

a. In paragraph (b), the phrase "Class A or Class B explosives" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (Class A or Class B explosive) materials", and the phrase "500 pounds" would be revised to read "225 kg (496 pounds)".

b. In paragraph (o) introductory text, the phrase "Class A or Class B explosives" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (Class A or Class B explosive) materials".

c. In paragraph (c), the phrase "high explosives, low explosives or black powder" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

d. In paragraphs (a), (d), (h), and (l), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials" and in paragraph (n) introductory text, the phrase "Class A explosive" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) material".

e. In paragraph (h), the word "Explosives" would be removed and replaced with the phrase "Class 1

(explosive) materials" both places it appears.

f. In the section heading and paragraphs (e), (f), (i), (j), (k), (n)(2), (o)(1), and (o)(4), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

g. In paragraphs (n)(1), (n)(3), (o)(2), and (o)(3), the phrase "8 miles per hour" would be removed and replaced with the phrase "13 km (8.1 miles) per hour".

§ 174.102 [Amended]

31. In § 174.102, the following changes would be made:

a. In paragraphs (a) and (b), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

b. In paragraph (b), "Explosives" and "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" in both places they appear.

§ 174.103 [Amended]

32. In § 174.103, the following changes would be made:

a. In paragraph (a), the phrase "high explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

b. In paragraphs (a), (c) introductory text, and (e), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

c. In paragraph (d), the phrase "at least 2 inches" would be removed and replaced with the phrase "at least 5 cm (2 inches)".

§ 174.104 [Amended]

33. In § 174.104, the following changes would be made:

a. In the section heading and paragraphs (a), (b) introductory text, (c), (d), (e), and (f), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

b. In paragraph (a), the phrase "80,000 pounds capacity" would be removed and replaced with the phrase "36,300 kg (80,028 pounds) capacity".

c. In paragraphs (b)(4), (b)(7), and (b)(8), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

d. In paragraph (b)(10), the phrase "three-eighths inch thick" would be removed and replaced with the phrase "1 cm (0.4 inch) thick".

e. In paragraph (b)(11), the phrase "at least 12 inches" would be removed and replaced with the phrase "at least 30 cm (11.8 inches)".

f. In paragraph (f), the phrase "7 by 7 inches or 6 by 8 inches" would be removed and replaced with the phrase "18 by 18 cm (7.1 by 7.1 inches) or 15 by 20 cm (5.9 by 7.9 inches)".

§ 174.105 [Amended]

34. In § 174.105, in the section heading and text, the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

§ 174.106 [Amended]

35. In § 174.106, in the section heading and paragraphs (a), (b), and (c), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

§ 174.107 [Amended]

36. In § 174.107, the following changes would be made:

a. In the section heading and paragraphs (a) and (b), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

b. In paragraph (b), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

§ 174.109 [Amended]

37. In § 174.109, the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

§ 174.110 [Amended]

38. In § 174.110, the following changes would be made:

a. The phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

b. The phrase "150 pounds" would be removed and replaced with the phrase "68 kg (149.9 pounds)".

c. The word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

d. The phrase "1 inch thick" would be removed and replaced with the phrase "2.5 cm (0.98 inch) thick".

e. The phrase "2 inches high" would be removed and replaced with the phrase "5 cm (2 inches) high".

f. The phrase "EXPLOSIVES A placards" would be removed and replaced with the phrase "EXPLOSIVES 1.1 or 1.2 (EXPLOSIVES A) placards".

g. The phrase "Explosives A" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

§ 174.112 [Amended]

39. In § 174.112, in the section heading and paragraphs (a), (b), (c) introductory text, and (c)(3), the phrase "Class B explosives" would be removed and replaced with the phrase "Division 1.3 (Class B explosive) materials and Division 1.2 (devices corresponding to Class B explosive) materials" each place it appears.

§ 174.114 [Amended]

40. In § 174.114, the following changes would be made:

a. The paragraph (a) designation would be removed.

b. The section heading phrase "EXPLOSIVES A laden cars" would be removed and replaced with the phrase "Cars loaded with Division 1.1 or 1.2 (explosive) materials".

c. The phrase "EXPLOSIVES A placards" would be removed and replaced with the phrase "EXPLOSIVES 1.1 or EXPLOSIVES 1.2 (EXPLOSIVES A) placards".

§ 174.115 [Amended]

41. In § 174.115, in the section heading and paragraphs (a), (b) introductory text, and (b)(3), the phrase "Class C explosives" would be removed and replaced with the phrase "Division 1.4 (Class C explosive) materials" each place it appears.

42. The subpart F heading would be revised to read as follows:

Subpart F—Detailed Requirements for Class 2 (Gases) Materials**§ 174.200 [Amended]**

43. In § 174.200, the following changes would be made:

a. In paragraphs (a) and (b), the phrase "Flammable gases" would be removed and replaced with the phrase "Division 2.1 (flammable gas) materials" and in paragraph (c) introductory text the phrase "flammable gases" would be removed and replaced with the phrase "Division 2.1 (flammable gas) materials".

b. In paragraph (c)(4), the phrase "over 130 degrees F" would be removed and replaced with the phrase "over 54°C (130°F)".

§ 174.201 [Amended]

44. In § 174.201, the following changes would be made:

a. In the section heading, the phrase "Compressed gas" would be removed and replaced with the phrase "Class 2 (gases) material".

b. In paragraphs (a) introductory text and (c), the phrase "compressed gases" would be removed and replaced with the phrase "Class 2 (gases) materials".

§ 174.204 [Amended]

45. In § 174.204, the following changes would be made:

a. In paragraph (a) introductory text, the phrase "compressed gas" would be removed and replaced with the phrase "Class 2 (gases) material".

b. In paragraph (a)(2)(i), the phrase "flammable cryogenic liquid" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) materials".

§ 174.208 [Amended]

46. In § 174.208, the following changes would be made:

a. In paragraph (a), the phrase "flammable liquid or gas" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials or Division 2.1 (flammable gas) materials".

b. In paragraph (b), the phrase "poisonous liquid, gas, or solid" would be removed and replaced with the phrase "Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials".

§ 174.280 [Amended]

47. In § 174.280, the following changes would be made:

a. In the section heading, the phrase "Poison gases" would be removed and replaced with the phrase "Division 2.3 (poisonous gas) materials".

b. In § 174.280, the phrase "poison label" would be removed and replaced with the phrase "POISON GAS label".

§ 174.290 [Amended]

48. In § 174.290, the following changes would be made:

a. In the section heading and paragraphs (a), (b) introductory text, (b)(2), (c), (d), (f), (g), (h), and (i), the phrase "Poison A" would be removed and replaced with the phrase "Division 2.3 (PG I, Zone A; poisonous gas) and Division 6.1 (PG I, Zone A; poisonous liquid) materials".

b. In paragraph (b)(1), the phrase "DOT-5A or WD-5A¹ metal drums" would be removed and replaced with the phrase "UN1N1 or UN1N2 metal drums, or equivalent military specification metal drums" and footnote 1 would be removed.

49. The subpart G heading would be revised to read as follows:

Subpart G—Detailed Requirements for Class 3 (Flammable Liquid) Materials**§ 174.300 [Amended]**

50. In § 174.300, the following changes would be made:

a. In paragraph (a), the phrase "Flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials" and in

paragraph (c) introductory text, the phrase "flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

b. In paragraph (b), the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

c. In paragraph (c)(4), the phrase "over 130 degrees F" would be removed and replaced with the phrase "over 54°C (130°F)".

d. Paragraph (d) would be removed and paragraph (e) would be redesignated as paragraph (d).

e. In newly designated paragraph (d), the phrase "flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

§ 174.304 [Amended]

51. In § 174.304, in the section heading the phrase "Flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials" and in the text the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) material".

52. In § 174.380, the section heading would be revised to read as follows:

§ 174.380 Class 3 (flammable liquid) materials, with a subsidiary hazard of Division 6.1 (poisonous) materials, with foodstuffs.**§ 174.380 [Amended]**

53. In § 174.380, the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

54. The subpart H heading would be revised to read as follows:

Subpart H—Detailed Requirements for Class 4 (Flammable Solid) Materials**§ 174.410 [Amended]**

55. In § 174.410, paragraph (d), the phrase "Specification 15A or 12C" would be removed and replaced with the phrase "UN4C1, UN4C2, or UN4G" and the phrase "(§§ 178.168, 178.206 of this subchapter)" would be removed.

56. Section 174.430 would be added to read as follows:

§ 174.430 Special handling requirements for Division 4.2 (pyroforic liquid) materials.

Cylinders containing Division 4.2 (pyroforic liquid) materials, unless packed in strong box or case and secured therein to protect valves, must be loaded with all valves and safety relief devices in the vapor space. All cylinders must be secured so that no shifting occurs in transit.

57. In § 174.480, the section heading would be revised to read as follows:

§ 174.480 Class 4 (flammable solid) materials, with a subsidiary hazard of Division 6.1 (poisonous) materials, with foodstuffs.

§ 174.480 [Amended]

58. In § 174.480, the phrase "flammable solid material" would be removed and replaced with the phrase "Class 4 (flammable solid) materials".

59. The subpart I heading would be revised to read as follows:

Subpart I—Detailed Requirements for Division 5.1 (Oxidizing) Materials

§ 174.510 [Amended]

60. In § 174.510, the phrase "listed in § 173.182(b) of this subchapter" would be removed.

61. In § 174.580, the section heading would be revised to read as follows:

§ 174.580 Division 5.1 (oxidizer) materials, with a subsidiary hazard of Division 6.1 (poisonous materials), with foodstuffs.

§ 174.580 [Amended]

62. In § 174.580, the phrase "oxidizer material" would be removed and replaced with the phrase "Division 5.1 (oxidizer) material".

63. The subpart J heading would be revised to read as follows:

Subpart J—Detailed Requirements for Division 6.1 (Poisonous) Materials

§ 174.600 [Amended]

64. In § 174.600, the phrase "Poison A" would be removed and replaced with the phrase "Division 2.3 (PG I, Zone A; poisonous gas) or Division 6.1 (PG I, Zone A; poisonous liquid), Packing Group I, materials" in the section heading and regulatory text.

§ 174.615 [Amended]

65. In § 174.615, the following changes would be made:

a. In paragraph (a), the phrase "Paris green" would be removed and replaced with the phrase "copper acetoarsenite (Paris green)".

b. In paragraphs (a) and (b), the phrase "poisonous materials" would be revised to read "Division 6.1 (poisonous) materials" each place it appears.

66. In § 174.680, the section heading would be revised to read as follows:

§ 174.680 Division 6.1 (poisonous) materials with foodstuffs.

67. The subpart K heading would be revised to read as follows:

Subpart K—Detailed Requirements for Class 7 (Radioactive) Materials

§ 174.700 [Amended]

68. In § 174.700, the following changes would be made:

a. In paragraphs (c), (d), (e)(2), and (e)(3), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material" each place it appears.

b. In the section heading and paragraphs (b), (c), (e) introductory text, (e)(1), and (f), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

c. In paragraph (c), the phrase "closer than three feet" would be removed and replaced with the phrase "closer than 1 meter (3.3 feet)", and the phrase "nor closer than 15 feet" would be removed and replaced with the phrase "nor closer than 4.5 meters (15 feet)".

d. In paragraph (d), the phrase "at least 20 feet" would be removed and replaced with the phrase "at least 6 meters (20 feet)".

e. In paragraph (e) introductory text, the phrase "weighing 15,000 pounds" would be removed and replaced with the phrase "weighing 6,805 kg (15,002 pounds)".

f. In paragraph (e)(1), the phrase "weighing 5,000 pounds" would be removed and replaced with the phrase "weighing 2,268 kg (5,000 pounds)".

g. In paragraph (e)(3), the phrase "weighing 700 pounds" would be removed and replaced with the phrase "weighing 315 kg (694.5 pounds)".

§ 174.715 [Amended]

69. In § 174.715, the following changes would be made:

a. In paragraphs (a) and (b), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (b), the phrase "at 3 feet" would be removed and replaced with the phrase "at 1 meter (3.3 feet)" and the phrase "3 inches high" would be removed and replaced with the phrase "8 cm (3.2 inches) high".

§ 174.750 [Amended]

70. In § 174.750, the following changes would be made:

a. In paragraphs (a) and (b), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials" each place it appears.

b. In paragraph (b), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

71. The subpart L heading would be revised to read as follows:

Subpart L—Detailed Requirements for Class 8 (Corrosive) Materials

§ 174.800 [Amended]

72. In § 174.800, the following changes would be made:

a. In the section heading, the phrase "corrosive materials" would be revised to read "Class 8 (corrosive) materials".

b. In paragraph (a), the phrase "corrosive liquids" would be revised to read "Class 8 (corrosive) materials".

c. In paragraph (a), the first and last sentences would be removed and the designation (a) would be removed.

d. Paragraphs (b) and (c) would be removed.

§ 174.810 [Amended]

73. In § 174.810, the following changes would be made:

a. In paragraph (a), the phrase "and may not be loaded or stored with explosives" would be removed.

b. In paragraph (b), the reference "§ 173.258" would be removed and replaced with the reference "§ 173.159".

§ 174.812 [Removed and Reserved]

74. Section 174.812 would be removed and reserved.

75. The subpart M heading would be revised to read as follows:

Subpart M—Detailed Requirements for Class 9 (Miscellaneous Hazardous) Materials

§ 174.840 [Amended]

76. In § 174.840, the reference "§ 173.1090" would be removed and replaced with "§ 173.216".

PART 175—CARRIAGE BY AIRCRAFT

77. The authority citation for part 175 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1807, 1808; 49 CFR part 1.

§ 175.10 [Amended]

78. In § 175.10, the following changes would be made:

a. In paragraph (a)(4)(i), the phrase "75 ounces (net weight ounces and fluid ounces)" would be removed and replaced with the phrase "2.2 kg (77.6 net weight ounces) or 2.2 liters (74.6 fluid ounces)".

b. In paragraph (a)(4)(ii), the phrase "16 fluid ounces or 1 pound" would be removed and replaced with the phrase "475 ml (16 fluid ounces) or 0.5 kg (1.1 pound)".

c. In paragraph (a)(3), the phrase "radioactive material" would be

removed and replaced with the phrase "Class 7 (radioactive materials)".

d. In paragraph (a)(13), the phrase "(dry ice)" would be removed and replaced with the phrase "(dry ice; i.e., Class 9 material)"; the phrase "5 pounds" would be removed and replaced with the phrase "2.3 kg (5.07 pounds)" both places it appears; and the references "§ 173.615(a)" would be removed and replaced with the phrase "§ 173.217".

e. In paragraph (a)(14)(vii), the phrase "ten feet" would be removed and replaced with the phrase "3 meters (9.8 feet)".

f. In paragraph (a)(17), the phrase "(dry ice)" would be removed and replaced with the phrase "(dry ice; i.e., Class 9 material)" and the phrase "4 pounds" would be removed and replaced with the phrase "2 kg (4.4 pounds)".

g. In paragraph (a)(19), the reference "§ 173.260(d)" would be removed and replaced with the reference "§ 173.159(d)".

§ 175.25 [Amended]

79. In § 175.25, in paragraph (a)(1), the phrase "75 ounces" would be removed and replaced with the phrase "2.2 kg (77.6 ounces)".

§ 175.30 [Amended]

80. In § 175.30, the following changes would be made:

a. In paragraph (c)(2), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (d)(2), the phrase "(carbon dioxide, solid)" would be removed and replaced with the phrase "(carbon dioxide, solid, Class 9 materials)".

§ 175.33 [Amended]

81. In § 175.33, paragraphs (a)(3) and (a)(6), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

§ 175.45 [Amended]

82. In § 175.45, the following changes would be made:

a. In paragraph (a)(2), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (a)(3), the phrase "etiologic agents" would be removed and replaced with the phrase "Division 6.2 (etiologic or infectious substance) materials" both places it appears.

§ 175.75 [Amended]

83. In § 175.75, the following changes would be made:

a. In paragraph (a)(2), the phrase "50 pounds net weight" would be removed and replaced with the phrase "25 kg (55 pounds) net weight"; the phrase "150 pounds net weight" would be removed and replaced with the phrase "75 kg (165 pounds) net weight"; and the phrase "nonflammable compressed gas" would be removed and replaced with the phrase "Division 2.2 (nonflammable compressed gas) materials".

b. In paragraphs (a)(3) introductory text and (a)(3)(ii), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

c. In paragraph (b), the phrase "ORM material" would be removed and replaced with the phrase "Class 9 (miscellaneous hazardous) materials, ORM-D or ORM-E materials".

§ 175.81 [Amended]

84. In § 175.81, paragraph (b), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

§ 175.85 [Amended]

85. In § 175.85, the following changes would be made:

a. In paragraph (c)(1)(i), the phrase "Radioactive (ICAO Class 7) materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (c)(1)(ii), the phrase "Poison B (ICAO Division 6.1) liquids and solids" would be removed and replaced with the phrase "Division 6.1 (poisonous or tear gas substances) materials".

c. Paragraphs (c)(1)(iii) and (c)(1)(vii) would be removed and paragraphs (c)(1)(iv) through (c)(1)(vi) would be redesignated as (c)(1)(iii) through (c)(1)(v).

d. In newly designated paragraph (c)(1)(iii), the phrase "Etiologic (ICAO Division 6.2) agents" would be removed and replaced with the phrase "Division 6.2 (etiologic or infectious substance) materials".

e. In newly designated paragraph (c)(1)(iv), the phrase "Flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials" and the phrase "73 °F. (23 °C.)" would be removed and replaced with the phrase "23 °C (73.4 °F)".

86. In § 175.85, newly designated paragraph (c)(1)(v) would be revised to read as follows:

§ 175.85 Cargo location.

(c) * * *

(1) * * *

(v) Class 9 (miscellaneous hazardous) materials, ORM-D and ORM-E materials.

§ 175.90 [Amended]

87. In § 175.90, paragraph (d) introductory text, the phrase "an etiologic agent" would be removed and replaced with the phrase "a Division 6.2 (etiologic or infectious substance) material".

§ 175.305 [Amended]

88. In § 175.305, paragraph (a), the reference "§ 173.120" would be removed and replaced with the reference "§ 173.220".

§ 175.310 [Amended]

89. In § 175.310, the following changes would be made:

a. In the introductory paragraph, the phrase "more than 20 gallons" would be removed and replaced with the phrase "more than 76 liters (20.1 gallons)".

b. In paragraph (c)(1), the phrase "5 gallons capacity" would be removed and replaced with the phrase "20 liters (5.3 gallons) capacity"; the phrase "DOT Specification 12B fiberboard box" would be removed and replaced with the phrase "UN4G fiberboard box"; the phrase "DOT Specification 15A, 15B, 15C, 16A, 19A or 19B wooden box" would be removed and replaced with the phrase "UN4C1 wooden box"; and the phrase "at least one-half inch thickness" would be removed and replaced with the phrase "at least 1.3 cm (0.5 inch) thickness".

c. In paragraph (c)(2), the phrase "10 gallons capacity" would be removed and replaced with the phrase "40 liters (10.6 gallons) capacity"; the phrase "DOT Specification 15A, 15B, 15C, 16A, 19A or 19B wooden box" would be removed and replaced with the phrase "UN4C1 wooden box"; and the phrase "at least one-half inch thickness" would be removed and replaced with the phrase "at least 1.3 cm (0.5 inch) thickness".

d. In paragraph (c)(3), the phrase "DOT Specification 17E container" would be removed and replaced with the phrase "UN1A1 container" and the phrase "5 gallons capacity" would be removed and replaced with the phrase "20 liters (5.3 gallons) capacity".

90. In § 175.320, paragraph (a), the table would be revised to read as follows:

§ 175.320 Cargo aircraft only; only means of transportation.

(a) * * *

Material	Class	Conditions
Detonators and detonating primer	Division 1.1 or 1.2 (Class A) explosives	Permitted only when no other hazardous material is aboard the aircraft.
Detonators and detonating primers	Division 1.4 (Class C) explosives	With the exception of Division 1.1 or 1.2 detonators and detonating primers, permitted only when there are no Division 1.1 or 1.2 (Class A) explosives aboard aircraft.
Fuel, aviation, turbine engine; methyl alcohol; or toluene.	Class 3 (flammable liquid)	Permitted in metal drums authorized for Packing Group I or II liquid hazardous materials having rated capacities of 220 liters (58.1 gallons) or less. May not be transported in the same aircraft with Class 1 (explosive), Class 5 (oxidizing), or Class 8 (corrosive) materials. Permitted in installed tanks each having a capacity of more than 450 liters (118.9 gallons) subject to the conditions specified in paragraph (c) of this section.
Gasoline	Class 3 (flammable liquid)	Permitted in metal drums having rated capacities of 220 liters (58.1 gallons) or less. May not be transported in the same aircraft with materials classed as Class 1 (explosive), Class 5 (oxidizing), or Class 8 (corrosive) materials. Permitted in installed tanks each having a capacity of 450 liters (118.9 gallons). Subject to the conditions specified in paragraph (c) of this section.
High explosives	Division 1.1 or 1.2 (Class A) explosives	Limited to Class 1 (explosive) material to be used for blasting. Permitted only when no other cargo is aboard the aircraft or when being transported in the same aircraft with an authorized shipment of any one or more of any of the following materials to be used for blasting: Ammonium nitrate-fuel oil mixtures. Blasting agent n.o.s. Detonating cord. Propellant explosive (solid) (Division 1.3) (water gels only) Propellant explosive (liquid) (Division 1.3) (water gels only)
Oil n.o.s.; petroleum oil or petroleum oil, n.o.s.	Class 3 (flammable liquid)	Permitted in metal drums having rated capacities of 220 liters (58.1 gallons) or less. May not be transported in the same aircraft with materials classed as Class 1 (explosive), Class 5 (oxidizing), or Class 8 (corrosive) materials. Permitted in installed tanks each having a capacity of 450 liters (118.9 gallons). Subject to the conditions specified in paragraph (c) of this section.
Combustible liquid n.o.s.	Class 3 (combustible)	Permitted in installed tanks each having a capacity of more than 450 liters (118.9 gallons) subject to the conditions specified in paragraph (c) of this section.

§ 175.320 [Amended]

91. In § 175.320, the following changes would be made:

a. In paragraph (b)(8), the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (explosive) materials".

b. In paragraph (b)(9), the phrase "within 50 feet" would be removed and replaced with the phrase "within 15 meters (49.2 feet)".

c. In paragraph (c) introductory text, the phrase "flammable liquids and combustible liquids" would be removed and replaced with the phrase "Class 3 (flammable and combustible liquid) materials" and the phrase "110 gallons" would be removed and replaced with the phrase "420 liters (110.9 gallons)".

d. In paragraph (c)(4)(iii), the phrase "flammable or combustible liquid" would be removed and replaced with the phrase "Class 3 (flammable or combustible liquid) materials" both places it appears and the phrase "within 50 feet" would be removed and replaced with the phrase "15 meters (49.2 feet)".

92. In § 175.630, the section heading would be revised to read as follows:

§ 175.630 Special requirements for Division 6.1 (poisonous or irritating) materials and Division 6.2 (etiologic or infectious substances) materials.

§ 175.630 [Amended]

93. In § 175.630, the following changes would be made:

a. In paragraph (a), the phrase "ETIOLOGIC AGENT label" would be removed and replaced with the phrase "INFECTIOUS SUBSTANCE label" and the phrase "poisons or etiologic agents" would be removed and replaced with the phrase "Division 6.1 (poisonous or irritating) materials or Division 6.2 (etiologic or infectious substance) materials" both places it appears.

b. In paragraph (b), the phrase "such poisons" would be removed and replaced with the phrase "such Division 6.1 (poisonous) materials".

94. In § 175.640, the section heading would be revised to read as follows:

§ 175.640 Special requirements for Class 9 (miscellaneous hazardous) material.

§ 175.640 [Amended]

95. In § 175.640, the reference "§ 173.1090" would be removed and replaced with "§ 173.216".

§ 175.700 [Amended]

96. In § 175.700, the following changes would be made:

a. In the section heading and

paragraph (b), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials" each place it appears.

b. In paragraph (c), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

§ 175.701 [Amended]

97. In § 175.701, in the section heading and paragraphs (b)(1) and (b)(2), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials" each place it appears.

§ 175.702 [Amended]

98. In § 175.702, the following changes would be made:

a. In the section heading and paragraphs (b)(2)(i) and (b)(2)(iv), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (a) and (b)(2)(iii), the phrase "20 feet (6 meters)" would be removed and replaced with the phrase "6 meters (20 feet)".

c. In paragraph (b)(2)(i), the phrase "30 feet (9 meters)" would be removed and replaced with the phrase "9 meters (29.5 feet)".

§ 175.703 [Amended]

99. In § 175.703, the following changes would be made:

a. In the section heading and paragraphs (a), (b), (c) introductory text, and (d)(3), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraph (c)(1), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

§ 175.705 [Amended]

100. In § 175.705, the section heading and paragraph (a), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials" each place it appears.

PART 177—CARRIAGE BY PUBLIC HIGHWAY

101. The authority citation for part 177 would continue to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1805, 49 CFR part 1.

§ 177.806 [Amended]

102. In § 177.806, paragraph (b), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

§ 177.810 [Amended]

103. In § 177.810, the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials" both places it appears.

§ 177.811 [Amended]

104. In § 177.811, paragraph (a), the phrase "(other than explosives)" would be removed and replaced with the phrase "(other than Class 1 (explosive) materials)".

§ 177.816 [Amended]

105. In § 177.816, paragraphs (a) and (b)(2), the phrase "flammable cryogenic liquid" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) materials".

§ 177.818 [Amended]

106. In § 177.818, the following changes would be made:

a. In the section heading, the phrase "flammable cryogenic liquids" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) materials".

b. In paragraph (a) introductory text, the phrase "flammable cryogenic liquid" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) material", and the

phrase "exceeding 125 gallons" would be removed and replaced with the phrase "exceeding 450 liters (118.9 gallons)".

§ 177.821 [Amended]

107. In § 177.821, the following changes would be made:

a. In paragraph (d), the phrase "high explosive" would be removed and replaced with the phrase "Division 1.1 or 1.2 (high explosive) material" both places it appears and the phrase "the explosive" would be removed and replaced with the phrase "the Class 1 (explosive) material" both places it appears.

b. In paragraph (f), the phrase "100 pounds net weight" would be removed and replaced with the phrase "45 kg (99.2 pounds) net weight"; in the first sentence of paragraph (f), the phrase "flammable solid" would be removed and replaced with the phrase "Class 4 (flammable solid) material"; and the phrase "not exceed 8 pounds" would be removed and replaced with the phrase "not exceed 3.6 kg (7.9 pounds)".

§ 177.825 [Amended]

108. In § 177.825, the following changes would be made:

a. In the section heading and paragraphs (a) introductory text, (b) introductory text, (b)(2)(iii), (c) introductory text, (d) introductory text, (d)(1)(i), (d)(1)(ii), and (d)(2)(iv), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraphs (a) introductory text, (f) introductory text, and (f)(3), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

§ 177.826 [Amended]

109. In § 177.826, the following changes would be made:

a. In the section heading and paragraphs (b)(2) and (b)(3), the phrase "flammable cryogenic liquids" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) materials".

b. In paragraphs (a) and (b)(3), the phrase "flammable cryogenic liquid" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) material".

§ 177.834 [Amended]

110. In § 177.834, the following changes would be made:

a. In paragraph (a), the phrase "flammable liquid, compressed gas, corrosive material, poisonous material, or radioactive material" would be removed and replaced with the phrase

"Class 3 (flammable liquid), Class 2 (gases), Class 8 (corrosive), Division 6.1 (poisonous), or Class 7 (radioactive) material".

b. In paragraph (c), the phrase "explosive, flammable liquid, flammable solid, oxidizing material, or flammable compressed gas" would be removed and replaced with the phrase "Class 1 (explosive), Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), or Division 2.1 (flammable gas) materials".

c. In paragraph (d), the phrase "explosive, flammable liquid, flammable solid oxidizing material, or flammable compressed gas" would be removed and replaced with the phrase "Class 1 (explosive), Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), or Division 2.1 (flammable gas) materials".

d. In paragraph (f), the phrase "any explosive" would be removed and replaced with the phrase "any Class 1 (explosive) material".

e. In paragraph (g), the phrase "explosives, flammable liquids, flammable solids, oxidizing materials, corrosive materials, compressed gases, and poisonous liquids or gases" would be removed and replaced with the phrase "Class 1 (explosive), Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), Class 8 (corrosive), Class 2 (gases) and Division 6.1 (poisonous) materials".

f. In paragraph (l)(1), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" both places it appears.

g. In paragraphs (l)(2)(i) introductory text and (l)(2)(iii)(A) introductory text, the phrase "flammable liquid or flammable gas" would be removed and replaced with the phrase "Class 3 (flammable liquid) or Division 2.1 (flammable gas) materials" and in paragraph (l)(2)(iii)(B) introductory text, the phrase "Flammable liquid or flammable gas" would be replaced with "Class 3 (flammable liquid) or Division 2.1 (flammable gas) materials".

h. In paragraph (l)(2)(i)(B), the phrase "130 °F. (54 °C)" would be removed and replaced with the phrase "54 °C (130 °F)", and the phrase "60 °F. (15.6 °C.)" would be removed and replaced with the phrase "16 °C (60.8 °F)".

i. In paragraph (l)(2)(iii)(A)(4), the phrase "130 °F. (54 °C.)" would be removed and replaced with the phrase "54 °C (130 °F)".

§ 177.835 [Amended]

111. In § 177.835, the following changes would be made:

a. In paragraph (c)(4)(i), the phrase "Initiating explosive" would be removed and replaced with the phrase "Substances, explosive, n.o.s., Class 1.1A (explosive) material (Initiating explosive)".

b. In paragraphs (g) introductory text, (g)(2)(i), and (j), the phrase "class A or class B explosive" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (Class A or Class B explosive) material".

c. In paragraph (f), the phrase "class A or class B explosives" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (Class A or Class B explosive) materials".

d. In paragraph (c) introductory text, the phrase "Class A explosives" would be removed and replaced with the phrase "Division 1.1 or 1.2 (Class A explosive) materials".

e. In paragraph (g) introductory text, the phrase "class C explosive" would be removed and replaced with the phrase "Division 1.4 (Class C explosive) material".

f. In the section heading and paragraphs (c) introductory text, (f), and (i), the word "Explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

g. In paragraphs (a), (b) introductory text, (b)(1), (e), (f), (h), (j), (k), and (m), the word "explosives" would be removed and replaced with the phrase "class 1 (explosive) materials" each place it appears.

h. In paragraphs (e), (i), (k), and (m), the word "explosive" would be removed and replaced with the phrase "Class 1 (explosive) material" each place it appears.

i. In paragraph (c)(4)(ii), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

j. In paragraph (c)(4)(iii), the phrase "Class A or B poisons" would be removed and replaced with the phrase "Division 2.3 (poisonous gas) or Division 6.1 (poisonous) materials".

k. In paragraphs (g)(2) introductory text and (g)(3)(i), the references "\$ 173.103(d)" and "\$ 173.66" would be removed and replaced with the reference "\$ 173.63".

l. In paragraph (g)(2)(ii), the phrase "24 inches" would be removed and replaced with the phrase "61 cm (24 inches)".

m. In paragraph (h), the phrase "other than as defined in § 173.53(e) of this subchapter," would be removed.

n. In paragraph (k), the phrase "other than as defined in § 173.53(e) of this chapter," would be removed.

o. In paragraph (m), the phrase "as defined in § 173.53(e) of this subchapter," would be removed.

p. In paragraph (k), the phrase "900 quarts" would be removed and replaced with the phrase "850 liters (898.2 quarts)"; the phrase "10 quarts" would be removed and replaced with the phrase "9.5 liters (10 quarts)"; and the phrase "7,500 pounds" would be removed and replaced with the phrase "3,400 kg (7,495.7 pounds)".

§ 177.836 [Amended]

112. In § 177.836, the word "explosive" would be removed and replaced with the phrase "Class 1 (explosive) material".

§ 177.837 [Amended]

113. In § 177.837, the following changes would be made:

a. In the section heading, the phrase "Flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

b. In paragraph (b), the phrase "flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

c. In paragraphs (a) and (b), the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) material".

d. Paragraph (d) would be removed and paragraph (e) would be redesignated as paragraph (d).

e. In newly designated paragraph (d) introductory text, the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) material".

114. In § 177.838, the section heading would be revised to read as follows:

§ 177.838 Class 4 (flammable solid) materials, Class 5 (oxidizing) materials, and Division 4.2 (pyroforic liquid) materials.

§ 177.838 [Amended]

115. In § 177.838, the following changes would be made:

a. In paragraphs (a) and (b), the phrase "flammable solids or oxidizing materials" would be removed and replaced with the phrase "Class 4 (flammable solid) or Class 5 (oxidizing) materials" each place it appears.

b. In paragraph (c), the phrase "4 inches wide" would be removed and replaced with the phrase "10 cm (3.9 inches) wide" and the phrase "6 inches" would be removed and replaced with the phrase "15 cm (5.9 inches)".

c. In paragraph (e)(2), the phrase "Flammable liquides" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

d. In paragraph (f), the phrase "listed in § 173.182(b) of this subchapter" would be removed.

e. In paragraph (g), the phrase "not exceeding 100 pounds" would be removed and replaced with the phrase "not exceeding 45 kg (99.2 pounds)", the phrase "flammable solid" would be removed and replaced with the phrase "Class 4 (flammable solid) material", the phrase "not exceed 8 pounds" would be removed and replaced with the phrase "not exceed 3.6 kg (7.9 pounds)", the phrase "DOT-12A65, 12B65, or 12H65 fiberboard boxes" would be removed and replaced with the phrase "UN4G fiberboard boxes", and the phrase "not exceed 16 pounds" would be removed and replaced with the phrase "not exceed 7.26 kg (16.01 pounds)".

116. In § 177.838, a new paragraph (h) would be added to read as follows:

(h) Division 4.2 (pyroforic liquid) materials in cylinders. Cylinders containing Division 4.2 (pyroforic liquid) materials, unless packed in a strong box or case and secured therein to protect valves, must be loaded with all valves and safety relief devices in the vapor space. All cylinders must be secured so that no shifting occurs in transit.

§ 177.839 [Amended]

117. In § 177.839, the following changes would be made:

a. In the section heading and paragraphs (b) and (d), the phrases "Corrosive liquids", "corrosive liquids", "Corrosives" and "corrosives" would be removed and replaced with the phrase "Class 8 (corrosive) materials" each place they appear.

b. In paragraph (a), the phrases "carboy or other" and "carboys or other" would be removed.

c. In paragraph (b), the phrases "Carboys and", "carboys and", and "carboys or" would be removed.

§ 177.840 [Amended]

118. In § 177.840, the following changes would be made:

a. In the section heading, the phrase "Compressed gases" would be removed and replaced with the phrase "Class 2 (gases) materials".

b. In paragraphs (a) introductory text, (a)(1), and (b) introductory text, the phrase, "compressed gases" would be removed and replaced with the phrase "Class 2 (gases) materials".

c. In paragraph (d), the phrase "flammable compressed gas" would be removed and replaced with the phrase "Division 2.1. (flammable gas) material".

d. In paragraphs (h) introductory text, (i), and (j) introductory text, the phrase "flammable cryogenic liquid" would be removed and replaced with the phrase "Division 2.1 (flammable cryogenic liquid) material".

e. In paragraphs (h) introductory text, the phrase "exceeding 125 gallons" would be removed and replaced with the phrase "exceeding 450 liters (118.9 gallons)".

119. In § 177.841, the section heading would be revised to read as follows:

§ 177.841 Division 6.1 (poisonous or tear gas substances) and Division 2.3 (poisonous gas) materials.

§ 177.841 [Amended]

120. In § 177.841, the following changes would be made:

a. Paragraph (a)(1) would be removed, the text in paragraph (a)(2) would be added as the last sentence in paragraph (a) introductory text, and the designation (a)(2) would be removed.

b. Paragraph (b) would be removed and reserved.

c. In paragraph c, the phrase "Class A poison or irritating materials" would be removed and replaced with the phrase "Division 2.3 (poisonous gas) or Division 6.1 (poisonous or tear gas substances) materials".

d. In paragraph (c), the phrase "Class A poison or irritating material" would be removed and replaced with the phrase "Division 2.3 (poisonous gas) or Division 6.1 (poisonous or tear gas substances) material".

e. In paragraph (d) introductory text, the word "poisons" would be removed and replaced with the phrase "Division 6.1 (poisonous) materials".

f. In paragraph (e), the phrase "labeled 'Poison', 'Poison gas', or 'Irritant'" would be removed and replaced with

the phrase "labeled 'POISON' or 'POISON GAS'".

§ 177.842 [Amended]

121. In § 177.842, the following changes would be made:

a. In the section heading, the phrase "Radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

b. In paragraphs (b) and (f), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

c. In paragraphs (a) and (e), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

d. In paragraph (f), the phrase "at least 20 feet" would be removed and replaced with the phrase "at least 6 meters (20 feet)".

§ 177.843 [Amended]

122. In § 177.843, the following changes would be made:

a. In paragraph (a), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In paragraphs (b) and (c), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

c. In paragraph (b), the phrase "3 feet" would be removed and replaced with the phrase "1 meter (3.3 feet)", and the phrase "1 '3 inches high" would be removed and replaced with the phrase "7.5 cm (3 inches) high".

123. In § 177.844, the section heading would be revised to read as follows:

§ 177.844 Class 9 (miscellaneous hazardous) materials.

§ 177.844 [Amended]

124. In § 177.844, the reference "§ 173.1090" would be removed and replaced with the reference "§ 173.216".

125. § 177.848 would be revised to read as follows:

§ 177.848 Segregation of hazardous materials.

(a) This section applies to materials which meet one or more of the hazard classes defined in this subchapter and are:

(1) In packages which require labels in accordance with Part 172 of this subchapter;

(2) In a compartment within a multi-compartmented cargo tank; or

(3) In a portable tank loaded in a transport vehicle or freight container.

(b) In addition to the provisions of paragraph (d) of this section, when a transport vehicle is to be transported by vessel, other than a ferry vessel, hazardous materials on or within that vehicle shall be stowed and segregated in accordance with §§ 176.83 and 176.144 of this subchapter.

(c) In addition to the provisions of paragraph (d) of this section, cyanides or cyanide mixtures shall not be loaded or stored with acids.

(d) Hazardous materials shall not be loaded, transported, or stored together, except as provided in this section and in accordance with the following Table.

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gases packing group I only	3	4.1	4.2	4.3	5.1	5.2	6.1 liquids packing group I only	7	8 liquids only
Explosives.....	1.1 and 1.2 A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Explosives.....	1.3	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Explosives.....	1.4	*	*	*	*	*	O	O	O	O	O	O	O	O	O	O	O	O
Very insensitive explosives.....	1.5	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive explosives.....	1.6	*	*	*	*	*												
Flammable gases.....	2.1	X	X	O	X				O			O	O	O	O	O	O	O
Non-toxic, non-flammable gases.....	2.2	X	X	O	X													
Poisonous gases: packing group I only.....	2.3	X	X	O	X		O			X	X	X	X	X	X			X
Flammable liquids.....	3 B	X	X	O	X			X	X		O	O	O	O	O	X		O
Flammable solids.....	4.1 B	X	X	O	X			X	X	O						X		O
Spontaneously combustible materials.....	4.2	X	X	O	X		O	X	X	O						X		X
Dangerous when wet materials.....	4.3	X	X		X		O	X	X	O						X		X
Oxidizers.....	5.1 A, B	X	X		X		O	X	X	O						X		O
Organic peroxides.....	5.2 B	X	X		X		O	X	X	O						X		O
Poisonous liquids: packing group I only.....	6.1	X	X	O	X		O			X	X	X	X	X	X			X
Radioactive materials.....	7	X			X		O			O	O	X	X	O	O	X		
Corrosive liquids.....	8 B	X	X	O	X		O	X		O	O	X	X	O	O	X		

(e) Instructions for using the Segregation Table for Hazardous Materials set forth in paragraph (d) of this section are as follows:

(1) The letter "X" in the Table means that these materials shall not be loaded, transported, or stored together in the same transport vehicle or storage facility during the course of transportation.

(2) The letter "O" in the Table means that these materials shall not be loaded, transported, or stored together in the same transport vehicle or storage facility during the course of

transportation, unless separated by a distance of 1.2 m (4 feet) in all directions.

(3) The "X" in the Table means that segregation among different Class 1 (explosive) materials is governed by the Compatibility Table in paragraph (f) of this section.

(4) The notes in the second column of the Table mean the following:

(i) "A" means that ammonium nitrate fertilizer may be loaded or stored with Division 1.1 (Class A explosive) materials.

(ii) "B" means that the materials for which an "O" appears in the Table may be loaded and transported together if each class or division is separately palletized at a minimum height of 10.6 cm (4 inches) off the floor of the transport vehicle and separated by a distance of 1.2 m (4 feet) in all directions.

(f) Class 1 (explosive) materials shall not be loaded, transported, or stored together, except as provided in this section and in accordance with the following Table.

COMPATIBILITY TABLE FOR CLASS 1 (EXPLOSIVE) MATERIALS

Compatibility Group	A	B	C	D	E	F	G	H	J	K	L	N	S
A		X	X	X	X	X	X	X	X	X	X	X	X
B	X		X	X	X	X	X	X	X	X	X	X	
C	X	X		2	2	X	X	X	X	X	X	3	
D	X	X	2		2	X	X	X	X	X	X	3	
E	X	X	2	2		X	X	X	X	X	X	3	
F	X	X	X	X	X		X	X	X	X	X	X	
G	X	X	X	X	X	X		X	X	X	X	X	
H	X	X	X	X	X	X	X		X	X	X	X	
J	X	X	X	X	X	X	X	X		X	X	X	
K	X	X	X	X	X	X	X	X	X		X	X	
L	X	X	X	X	X	X	X	X	X	X		X	
N	X	X	X	X	X	X	X	X	X	X	1		X
S	X	X	3	3	3	X	X	X	X	X	X		

(g) Instructions for using the Compatibility Table for class 1 (explosive) materials set forth in paragraph (f) of this section are as follows:

(1) The letter "X" in the Table means that explosives of different compatibility groups shall not be carried on the same transport vehicle.

(2) The notes in the Table mean the following:

(i) "1" means an explosive from compatibility group L shall only be carried on the same transport vehicle with an identical explosive.

(ii) "2" means any combination of explosives from compatibility group C, D, or E is assigned to compatibility group E.

(iii) "3" means any combination of explosives from compatibility group C, D, or E with those in compatibility group N is assigned to compatibility group D.

(h) With one exception, explosives of the same compatibility group but of different divisions may be transported together, provided that the whole shipment is handled and transported as though its entire contents were of the lower division. For example, a mixed shipment of Division 1.2 (Class A explosive) materials and Division 1.4 (Class C explosive) materials, both of compatibility group D, must be handled and transported as Division 1.2 (Class A

explosive) materials. However, when Division 1.5 (blasting agent) materials, compatibility group D, are transported in the same freight container as Division 1.2 (Class A explosive) materials, compatibility group D, the shipment must be handled and transported as Division 1.1 (Class A explosive) materials, compatibility group D.

§ 177.853 [Amended]

126. In § 177.853, paragraph (c), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

§ 177.854 [Amended]

127. In § 177.854, the following changes would be made:

a. In paragraph (f) introductory text, the phrase "flammable liquids, flammable solids, oxidizing materials, corrosive materials, compressed gases, or poisons" would be removed and replaced with the phrase "Class 3 (flammable liquid), Class 4 (flammable solid), Class 5 (oxidizing), Class 8 (corrosive), Class 2 (gases), or Division 6.1 (poisonous) materials".

b. In paragraph (f)(1), the phrase "flammable liquids or flammable compressed gases and not transporting explosives, Class A, or Class B" would be removed and replaced with the phrase "Class 3 (flammable liquid) or

Division 2.1 (flammable gas) materials and not transporting Division 1.1, 1.2, or 1.3 (Class A or B explosive) materials".

c. In paragraph (f)(2), the phrase "flammable liquids or flammable compressed gases" would be removed and replaced with the phrase "Class 3 (flammable liquid) or Division 2.1 (flammable gas) materials", and the phrase "explosives Class A or Class B" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (explosive) materials".

d. In paragraph (g)(2)(iv), the phrase "explosives A or B, flammable liquids or flammable gases" would be removed and replaced with the phrase "Division 1.1, 1.2, or 1.3 (Class A or B explosive), Class 3 (flammable liquid), or Division 2.1 (flammable gas) materials".

e. In paragraph (h), the phrase "flammable liquid or poisonous liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) or Division 6.1 (poisonous liquid) material".

§ 177.855 [Amended]

128. In § 177.855, the following changes would be made:

a. In the section heading and paragraphs (a), (b), (c), and (f), the word "explosives" would be removed and replaced with the phrase "Class 1

(explosive) materials" both places it appears.

b. In paragraphs (c) and (e), the word "Explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials" each place it appears.

c. In paragraphs (a), (b), (c), and (f), the word "explosive" would be removed and replaced with the phrase "Class 1 (explosive) material".

d. In paragraph (a), the phrase "200 feet" would be removed and replaced with the phrase "61 meters (200.1 feet)" both places it appears.

e. In paragraph (d), Note 1, the phrase "1 ounce" would be removed and replaced with the phrase "30 grams (1.1 ounce)"; the phrase "7½ fluid ounces" would be removed and replaced with the phrase "222 ml (7.5 fluid ounces); the phrase "2 fluid ounces" would be removed and replaced with the phrase "60 ml (2 fluid ounces)"; and the phrase "3 fluid ounces" would be removed and replaced with the phrase "90 ml (3 fluid ounces)".

§ 177.856 [Amended]

129. In § 177.856, the following changes would be made:

a. In the section heading and paragraph (d), the phrase "flammable liquids" would be removed and replaced with the phrase "Class 3 (flammable liquid) materials".

b. In paragraphs (a), (b), and (d), the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) material".

§ 177.857 [Amended]

130. In § 177.857, the following changes would be made:

a. In the section heading and paragraph (b), the phrase "flammable solids and oxidizing materials" would be removed and replaced with the phrase "Class 4 (flammable solid) and Class 5 (oxidizing) materials".

b. In paragraphs (a) and (c), the phrase "flammable solid and oxidizing material" would be removed and replaced with the phrase "Class 4 (flammable solid) and Class 5 (oxidizing) material".

§ 177.858 [Amended]

131. In § 177.858, the following changes would be made:

a. In the section heading and paragraph (a), the phrase "corrosive materials" would be removed and replaced with the phrase "Class 8 (corrosive) materials".

b. In paragraphs (a) and (b)(2), the phrase "corrosive liquid" would be removed and replaced with the phrase "Class 8 (corrosive) material".

c. In paragraph (b) introductory text, the phrase "corrosive liquids" would be removed and replaced with the phrase "Class 8 (corrosive) materials".

§ 177.859 [Amended]

132. In § 177.859, the following changes would be made:

a. In the section heading, the phrase "compressed gases" would be removed and replaced with the phrase "Class 2 (gases) materials".

b. In paragraph (a), the phrase "compressed gas" would be removed and replaced with the phrase "Class 2 (gases) material".

c. In paragraph (b), the phrase "flammable gas" would be removed and replaced with the phrase "Division 2.1 (flammable gas) material".

d. In paragraph (b), the phrase "flammable compressed gas" would be removed and replaced with the phrase "Division 2.1 (flammable gas) material" each place it appears.

§ 177.860 [Amended]

133. In § 177.860, the following changes would be made:

a. In the section heading, the word "poisons" would be removed and replaced with the phrase "Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials".

b. In paragraph (a) introductory text, the phrase "any poison", would be removed and replaced with the phrase "any Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials", the phrase "poison, whether flammable or nonflammable" would be removed and replaced with the phrase "Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials, whether flammable or nonflammable"; and the phrase "poison in powdered form" would be removed and replaced with the phrase "Division 6.1 (poisonous) materials in powdered form".

c. In paragraph (a)(1), the phrase "poison (class A or B)" would be removed and replaced with the phrase "Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials", and the phrase "such poisons" would be removed and replaced with the phrase "such Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials".

d. In paragraph (b), the phrase "poison which is also flammable" would be removed and replaced with the phrase "Division 6.1 (poisonous) or Division 2.3 (poisonous gas) materials which are also flammable"; the phrase "flammable liquid" would be removed and replaced with the phrase "Class 3 (flammable liquid) material"; the phrase "any poison" would be removed and replaced with the phrase "any Division 6.1

(poisonous) or Division 2.3 (poisonous gas) materials"; the phrase "compressed gas" would be removed and replaced with the phrase "Class 2 (gases) material"; the phrase "flammable liquids and compressed gases" would be removed and replaced with the phrase "Class 3 (flammable liquid) and Class 2 (gases) materials"; and the phrase "the poison" would be removed and replaced with the phrase "the Division 6.1 (poisonous) or Division 2.3 (poisonous gas) material".

§ 177.861 [Amended]

134. In § 177.861, the following changes would be made:

a. In the section heading, paragraph (a), and Note 2 of paragraph (a), the phrase "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

b. In Note 1 of paragraph (a), the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) material".

§ 177.870 [Amended]

135. In § 177.870, the following changes would be made:

a. In paragraph (d), the phrase "100 pounds gross weight" would be removed and replaced with the phrase "45 kg (99.2 pounds) gross weight", and the phrase "Class C explosives" would be removed and replaced with the phrase "Division 1.4 (Class C explosive) materials".

b. In paragraph (e), the phrase "100 pounds" would be removed and replaced with the phrase "45 kg (99.2 pounds)"; the phrase "500 pounds" would be removed and replaced with the phrase "225 kg (496 pounds)"; and the phrase "250 pounds" would be removed and replaced with the phrase "133.4 kg (250 pounds)".

c. In paragraph (c), the word "Explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

d. In paragraphs (b), (d), and (e), the word "explosives" would be removed and replaced with the phrase "Class 1 (explosive) materials".

e. In paragraph (c), the word "explosive" would be removed and replaced with the phrase "Class 1 (explosive) material".

f. In paragraph (f), the word "Poisons" would be removed and replaced with the phrase "Division 6.1 (poisonous or irritating) or Division 2.3 (poisonous gas) materials"; the phrase "poison, class A, any tear gas or irritating substance, class C, any less dangerous poison, class B, which is a liquid" would be removed and replaced with the phrase

"Division 6.1 (poisonous or irritating) or Division 2.3 (poisonous gas) materials"; the phrase "poison, class B" would be removed and replaced with the phrase "Division 6.1 (poisonous) material"; and the phrase "100 pounds" would be removed and replaced with the phrase "45 kg (99.2 pounds)".

f. In paragraph (g), the phrases "Radioactive materials" and "radioactive materials" would be removed and replaced with the phrase "Class 7 (radioactive) materials", and the phrase "radioactive material" would be removed and replaced with the phrase "Class 7 (radioactive) materials".

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