



Grandfathering of Competent Authority Approved Packages

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1. Abstract

International Atomic Energy Agency transportation regulations are reviewed and revised on a periodic basis as new technical and scientific information becomes available. The 1996 Edition of the Regulations for the Safe Transport of Radioactive Materials in TS-R-1 includes provisions for the use of package designs approved to previous editions of the regulations. This assures that there is no disruption of transport when the regulations are updated and revised. The revision of package design standards may make certain designs obsolete, though not necessarily unsafe. The U.S. Nuclear Regulatory Commission is the agency in the United States that certifies transportation packages for Type B and fissile materials. NRC regulations include grandfathering provisions that are comparable to and compatible with the IAEA standards. NRC staff is promoting a new system that would eliminate the need to grandfather package designs. Under the new method, any new or revised provision of the regulations that affects package standards would include its own transitional arrangements. In this way, each change would be evaluated for its safety importance. Changes in the package standards that are important to safety would be implemented immediately upon the regulations coming into force. Other changes, that do not significantly affect safety, would have longer implementation periods. In this way, all packages in use would be compatible with the regulations in force, and no specific grandfathering provisions for older designs would be needed. NRC staff has concluded that the package design standards are mature and have been shown to be protective over the past 40 years of shipping experience. We predict that future changes in package design standards will not be substantive in terms of resulting in significant changes in physical performance of a package in transport, including actual transportation accidents. The benefits of the new system would be a more predictable regulatory structure for the use of packages that would minimize administrative regulatory burden.

2. Use of Previously Approved Designs

The IAEA transportation regulations include performance standards for various types of packages and materials, including competent authority approved package designs. When the regulations are updated and revised, the new regulations have historically included transitional arrangements, or "grandfathering" provisions to ensure that packages approved to previous editions of the regulations may continue in use. The grandfathering provisions allow continued use, coupled with certain restrictions with respect to changes in the package design and fabrication of new packagings. In addition, older designs are typically subject to multilateral approval. With the 1996 edition of the regulations, the IAEA adopted a two-year revision cycle. In addition, with the 1996 edition of the regulations, packages approved to the 1967 Edition of the regulations were no longer authorized for continued use. That is, continued use was limited to packages approved to the two latest editions of the regulations (the 1973 and the 1985 Editions). These two changes generated a new interest in the way previously approved packages are authorized for continued use in transport. Although there has been no new edition of the regulations since 1996, the concerns regarding continued use of older designs has remained.

3. U.S. NRC Regulations

NRC has recently revised its transportation regulations to be compatible with the 1996 Edition of TS-R-1. The NRC regulations include grandfathering provisions that are analogous to and compatible with IAEA regulations in TS-R-1. The provisions are included in U.S. Code of Federal Regulations, Title 10, Part 71, Section 71.19, and become effective October 1, 2004. Like the IAEA provisions, NRC limits fabrication of new packagings based on designs approved to previous standards. NRC also limits changes in the packaging or the authorized contents for previously approved designs. The NRC regulations state that the design will be designated with a "-96" upon receipt of an application that shows that the package meets the current requirements in 10 CFR Part 71. The continued use of packages approved to the 1967 Edition of the IAEA regulations will not be authorized after October 1, 2008.

4. NRC Implementation of Grandfathering Provisions

NRC staff has developed a practice with respect to review of previously approved packages to current regulatory standards. The certificate holder for the package design must submit an application for package approval that

demonstrates that the older design meets the new regulatory standards. In general, the application for package approval must be whole and complete and must address all changes in regulatory standards. For example, the package application for a “-96” designation may include a new section in the structural evaluation with calculations for the 200-meter water immersion test, if applicable.

The NRC review also would consider any new or revised regulatory guidance with respect to package reviews. For example, staff practices for package reviews are contained in NRC guidance documents NUREG-1609 [1] and NUREG-1617 [2], and supplemental guidance documents called Interim Staff Guidance documents, or ISGs. ISGs are issued periodically and typically address a single emergent safety issue. Applications for upgrading package designs to later standards would also address any new guidance that has been issued since the design was originally approved.

Since upgrading the package design to the current standards allows indefinite continued fabrication of new packagings, staff also reviews packaging drawings and acceptance tests for newly fabricated packagings. The packaging drawings, which are engineering drawings and not detailed fabrication drawings, show the safety features of the package. Packagings used for shipment of radioactive material must comply in all respects to these drawings that are referenced in the Certificate of Compliance.

NRC regulations in 10 CFR 71.19 limit modifications of previously approved Type B and fissile material packages. Any modification, either to a packaging design or the authorized contents, must not be significant with respect to the design, operating characteristics or safe performance of the containment system, and must not be significant with respect to the prevention of criticality. This limits the types of changes that can be made to older designs. For example, in the U.S., changes in contents that are not clearly bounded by the previous approval are not authorized for a grandfathered package. Likewise, changes in the design of the containment system are not authorized for grandfathered designs. To make such changes a package must be approved to the current regulatory standards.

NRC staff believes that there is a disincentive for package certificate holders to upgrade package designs to the current standards. First, the applicant must evaluate the package design to the new or revised standards. Second, actual design changes may be necessary for the package to incorporate these changes in the standards. This may be a significant effort, particularly for large fleets of packages that may be owned by a large number of shippers. Third, the certificate holder must prepare and submit a new and revised application for the package design. Fourth, in the U.S., the NRC staff time expended to review the upgraded design is billed directly to the applicant. For complex designs, this review time may be significant. And fifth, applicants perceive that submitting the package design for review may result in additional findings that may jeopardize future use of the package. Thus, for package designs that are not being fabricated, certificate holders typically do not evaluate the package against newer regulatory standards.

5. Other Methods of Grandfathering

Other countries have implanted different methods of grandfathering packages and evaluating package designs to updated regulatory standards. Informal communications indicate that these practices vary greatly. In some countries, the competent authority technical staff initiates its own review of designs that may be affected by new regulatory standards. The competent authority may then assign the “-96” designation for packages that are not affected by new or revised regulations. Some countries do not allow use of older designs once the new regulations come into force. In some countries, each certificate holder is responsible for submitting a new package application, which is subjected to a complete technical review.

In addition, there is significant variability with respect to how changes in the package design (contents and packaging) are authorized for grandfathered designs. Some countries allow changes to the design provided that the change itself is reviewed against the current regulatory standards. In the U.S., changes that are significant with respect to safety are not authorized for grandfathered packages. To make such changes, the entire design, including the changes, must be reviewed against the current regulations.

6. New Proposal for Grandfathering

With the publication of the 1996 Edition of the Regulations, IAEA adopted a two-year revision cycle. It was recognized that updating the regulations could result in problems with respect to grandfathering of competent authority-approved package designs. Certifying a design to regulations that change every two years would be

difficult, since designing, testing, and certifying a new package design is a multiyear process. Developing new designs is expensive, and building packagings to a design that could quickly become obsolete would be costly. Although the revision cycle has not resulted in new editions of the regulations since 1996, the need to review grandfathering provisions has remained.

NRC staff is considering a new method for transitional arrangements for packages. The new consideration is to include specific transitional arrangements for each new or revised regulatory requirement for packages. For example, if a new drop test is introduced for Type B packages, the regulatory provision would describe the test requirement and would include a mandatory date of implementation. This transition period would be based on the safety significance of the new requirement.

To illustrate the concept, we take the following example of a revised requirement that was introduced into the 1996 regulations, that is, the 200 meter immersion test for some packages other than spent fuel. This revised requirement did not have a mandatory implementation period. Packages that were previously approved (i.e., packages with the "-85" designation) were not required to be evaluated to the new test. These packages may be used indefinitely without meeting this test requirement. Newly designed packages with the "-96" designation would include this test requirement. Under the provisions of Paragraph 817 of TS-R-1, packages approved to the 1985 standards are authorized for use indefinitely. In addition, "-85" packages are subject to multilateral approval after December 31, 2003, and fabrication of new packagings was authorized to begin until January 1, 2007. It appears that the provision was added, but that the safety significance was not considered great enough to require immediate implementation. Conversely, Paragraph 680, which specifies additional package requirements for fissile packages transported by air, was imposed on all shipments as soon as the regulations came into force (January 2001).

In addition, there were some requirements that were revised to be less restrictive in the new regulations. For example, for packages that are not transported by air, the reduced external pressure requirement in Paragraph 643 was revised from 25 to 60 kPa. Since the revised standard is less restrictive, no change in the package design or evaluation would be needed.

Under the new method, for each new or revised packaging standard, the transitional arrangements with respect to that standard would be specified in the same paragraph as the regulatory requirements.

7. Implementation of a New Grandfathering Method

Because each new or revised package standard would have its own transitional arrangements, there would be no need to grandfather designs approved to different editions of the regulations. The certificate of compliance for the package design would specify which of the regulations the package design had been demonstrated to meet. For example, in the case of the 200 meter immersion test, the certificate might include the notation that the package had not been evaluated to Paragraph 657 of the 1996 edition of the regulations.

8. Conclusions

The NRC supports the stability of the IAEA regulations. Changes in package standards must only be considered when there is a clear safety benefit. In addition, an improved method of grandfathering packages approved to earlier standards should be explored. This combination would assure orderly upgrading of package designs to benefit safety without unnecessary regulatory burden.

9. References

[1] U.S. Nuclear Regulatory Commission, "Standard Review Plan for Transportation Packages for Radioactive Material," NUREG-1609, May 1999.

[2] U.S. Nuclear Regulatory Commission, "Standard Review Plan for Transportation Packages for Spent Nuclear Fuel," NUREG-1617, March 2000.