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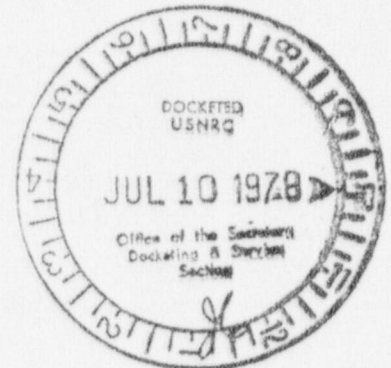
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DOCKET NUMBER

PROPOSED RULE

PR-Misc. Notice
Reg. Guide

June 6, 1978



Mr. Robert B Minoque, Director
Office of Standards Development
U.S. Nuclear Regulatory Commission
Washington D.C. 20555

Subject: Regulatory Guide 1.91 (Revision 1, February 1978, For Comment)
"Evaluations of Explosions Postulated to Occur on
Transportation Routes Near Nuclear Power Plants"

Dear Sirs:

Ebasco Services has reviewed the subject Regulatory Guide and we would like to offer several comments for your consideration:

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- C.1 This Regulatory Position and the qualifying text found in Section B should be revised to reflect the following:
- a) The Regulatory Position does not discuss the methodology for deriving the mass of the hazardous material in the phase explosion. For an upper bound explosion, a stoichiometric hydrocarbon/air mixture should be assumed. The mass of the hazardous material should be determined from this mixture for the volume of the transportation mode considered.
 - b) The Regulatory Position gives no guidance with respect to how the NRC Staff will review justification for lower yields. This is consistent with the stated purpose of the guide, "Methods acceptable to the NRC Staff for determining whether the risk of damage due to an explosion on a nearby transportation route is sufficiently high to warrant a detailed investigation," but is inconsistent with the last sentence of the Regulatory Position which requires the analysis to justify a lower effective yield. This sentence should be deleted since there is no

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relationship between the upper bound yield, which is used as a conservative guide to determine safe distances, and the yield which will be determined from a detailed investigation, if required.

Similarly, the words "when effective yields generated from test data do not exist" should be deleted since upper bounds are presumably generated from test data or calculations acceptable to the staff. Considering the fact that detailed investigations will have to be performed, the NRC Staff should provide specific guidance by references in Part B to the calculations, the testing criteria, and the results of currently acceptable tests which support the NRC Staff conclusions.

- c) The term "upper bound" should be quantified for both solids and vapor in terms of classes or groups of hydrocarbons. As noted above, the purpose of the upper bound is to provide a conservative yield for establishing stand-off distances. The use of a single upper bound for all substances is not conservative with respect to the number of detailed analyses which may be required but are not really necessary. For example, a mass equivalence of 100% would be a conservative upper bound for vapor phase explosions of the most commonly transported hydrocarbons (i.e. gasoline, isooctane, benzene, ethane, methanol, and natural gas) as discussed in Part B, paragraph 6.

C.2 This Regulatory Position allows the exclusion of explosions as a design basis where the probabilities of an explosion exceeding a 1 psi peak positive incident over pressure are acceptably low. However, as written, the Regulatory Position inadequately expresses the staff positions and could result in a multiplicity of approaches. Ebasco suggests that the staff intent be clarified with respect to following:

- a) The Regulatory Position does not reference Part B formulas (2) and (3) as acceptable for determining probabilities. This is however, acceptable to Ebasco since these formulas are quite general.
- b) The "adequate data base" necessary to determine the exposure rate at the site should be quantified sufficiently to provide a basis for determining both the minimum number of events required for determining the explosion rate and the minimum number of years which must be evaluated.

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- c) The explosions evaluated in developing the data base should not consider those explosions occurring when docked, (i.e. loading and unloading) or in docking unless these activities occur within the exposure distance. This comment is based on the higher incidences of explosions at these times which could distort probability calculations. Also, this is the approach used by the NRC Staff for aircraft crash evaluations.
- d) The discussion should be revised to make clear the staff intent with respect to conservative and realistic assumptions. For instance, the discussion requires the addition of exposure rates for a single substance where transported by different modes. This would be a very conservative assumption where two modes are involved and the exposure, for design purposes, is from different sides of the plant.
- e) Since national statistics will not vary from project to project, the NRC Staff can avoid a multiplicity of approaches by promulgating these values. The applicant could then determine whether national statistics are conservative or unconservative with respect to the existing local data base. The Staff determination should be referenced so that the scope of the material substances and transportation conditions which were considered is understood when making this comparison.
- f) There is no guidance with respect to the method the NRC Staff expects to be used in determining what class of explosions can exceed 1 psi.

C.3 The discussion of formula (4) should be revised to reflect the fact that when determining an appropriate equivalent static load for assessing the capacity of structures to resist blast loading, elastoplastic behavior may be assumed with appropriate ductility ratios provided excessive deflections do not result in loss of function of any safety related system.

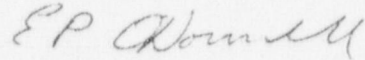
In conclusion, one general observation should be made. The guide is lacking in most of the details necessary to perform a site specific evaluation. Ebasco recommends that the guide be revised to divorce it from all aspects of the detailed analysis whose need is determined by using the guide unless specific guidance on that analysis is to be given.

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Ebasco hopes these comments will be considered carefully when the guide is revised and would welcome the opportunity to participate in any discussions the NRC Staff has on the subject.

Very truly yours,



E P O'Donnell
Chief Engineer
Nuclear Licensing