



Calculation Cover Sheet

Subject TNT Mass Equivalents for Chemicals Transported By Rail
 Discipline Mechanical, Nuclear & Environmental

Project VC Summer Units 2 & 3
 Job No. 25242
 Calc. No. 25242-ENV-012
 Sheet 1 of 8

Calculation Status Designation	Preliminary <input type="checkbox"/>	Confirmed with Preliminary Information <input type="checkbox"/>	Confirmed <input checked="" type="checkbox"/>	Superseded <input type="checkbox"/>	Voided <input type="checkbox"/>
Computer Program/Type	SCP <input type="checkbox"/>	Program No. None	Version/Release None	Operating System None	
Nuclear Quality Classification	Safety-Related <input checked="" type="checkbox"/>	Augmented Quality <input type="checkbox"/>	Nonsafety-Related <input type="checkbox"/>		

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This calculation has been reviewed by Bechtel Power Corporation and any proprietary information has been removed. Wherever proprietary information has been removed, brackets have been inserted containing the statement "Proprietary Information Deleted"

Rev. No.	Reason for Revision	Total No. of Sheets	Last Sheet No.	By	Checked	Approved/ Accepted	Date
001	Updated chemicals reviewed based on 2009 list from Norfolk Southern Railroad (Rev. 0 based on 2006 list), added calculations for 2 chemicals, and modified the presumed temperature and chemical quantities to reflect more conservative parameters	31	App. G, pg. 1	MPM	SWS	NJC	2/24/10
000	Initial Issue	15	Att. F, pg. 2	DMN	SWS	RJK/DCP	10/11/07

Record of Revisions

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BY: M.P. Merritt	DATE: 1/15/10	SHEET REV: 001	

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1.0 PURPOSE

Regulatory Guide 1.206 (RG 1.206), Combined License Applications for Nuclear Power Plants, requires that design-basis events be identified along with the potential effects of those accidents on the nuclear power plant in terms of the design parameter or physical phenomena. Design-basis events are defined as those accidents, internal and external to the nuclear power plant, that have a probability of occurrence on the order of magnitude of 10^{-7} per year or greater and potential consequences serious enough to affect the safety of the plant to the extent that the guidelines in 10 CFR Part 100 (Reactor Site Criteria) could be exceeded (NRC 2007). The expected rate of occurrence exceeding the guidelines in 10 CFR Part 100 on the order of magnitude of 10^{-6} per year is acceptable if, when combined with reasonable qualitative argument, the realistic probability can be shown to be lower.

The purpose of this calculation is to estimate the impact of explosive chemicals transported by rail on the Combined Operating License Application (COLA) for VC Summer Units 2 and 3. Explosive fluids are transported on the Norfolk Railroad near the proposed Units and an explosion of any of these stored fluids could disrupt plant operations and affect plant safety. Therefore, all of these fluids will be evaluated by calculating their TNT mass equivalents and the safe distances away from their storage sites.

Reason for Revision

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2.0 REFERENCES

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3.0 BACKGROUND

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4.0 METHODOLOGY

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5.0 ASSUMPTIONS

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6.0 INPUT DATA

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7.0 CALCULATIONS

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8.0 CONCLUSIONS

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According to information contained in Appendix G, the distance from the chemical transport to the closest proposed Unit is 4,200 ft. Difluoromethane was the worst case with an incident overpressure of 1 psi occurring 2,795 ft. from the transport. This leaves a safe distance of approximately 1,405 ft.

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Appendix A: Chemical Screening Analysis

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Appendix A: Chemical Screening Analysis

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Appendix A: Chemical Screening Analysis

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Appendix A: Chemical Screening Analysis

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Appendix A: Chemical Screening Analysis

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Appendix A: Chemical Screening Analysis

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Appendix B: Hazardous Materials Information Request, June 23, 2006

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Appendix B: Hazardous Materials Information Request, June 23, 2006

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Appendix C: Hazardous Materials Location W122 Blair SC Summary Top 25 Commodities Loaded Shipments Latest 12 Months Ending July 31, 2009

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Appendix D: Example of Methodology

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Appendix E: Total Liquid and Vapor Mass Calculations

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Appendix F: TNT Mass Equivalents and Safe Distances

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Appendix G: Norfolk Railroad in Relation to the Nearest Safety Related Structure

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