

ATTACHMENT 2

**Calculation 32-2400572-02,
"Natural Gas Pipeline Hazard Risk Determination"**

All subsequent pages removed under 10 CFR 2.390 (pages 4 through 54).

A
FRAMATOME ANP

CALCULATION SUMMARY SHEET (CSS)

Document Identifier 32 - 2400572 - 02

Title Natural Gas Pipeline Hazard Risk Determination

PREPARED BY:

REVIEWED BY:
METHOD: DETAILED CHECK INDEPENDENT CALCULATION

NAME S.T. Thomson

NAME J.H. Snooks

SIGNATURE S.T. Thomson

SIGNATURE J.H. Snooks

TITLE Sr Engineer DATE 1/16/04

TITLE Sr Env Consultant DATE 1/19/2004

COST CENTER 41739 REF. PAGE(S) 9

TM STATEMENT: REVIEWER INDEPENDENCE [Signature] 1/19/04

This document including the information contained herein and any associated drawings, is the property of Framatome ANP, Inc. It contains confidential information and may not be reproduced or copied in whole or in part nor may it be furnished to others without the expressed written permission of Framatome ANP, Inc., nor may any use be made of it that is or may be injurious to Framatome ANP, Inc. This document and any associated drawings and any copies that may have been made must be returned upon request.

PURPOSE AND REASON FOR REVISION 02:

This calculation has been revised to include the natural gas transmission incident data and telephonic incident notifications as an attachment. Also, the number of explosions was increased from six to seven to include an incident where both an ignition explosion occurred (i.e., NRC no. 437627). Therefore, the estimated gas line rupture and subsequent hazards yearly probability was recalculated and has been revised to 9.44×10^{-6} .

Document Pagination

Cover & Document	1-13	Attachment 6	26-27
Attachment 1	14	Attachment 7	28
Attachment 2	15-16	Attachment 8	29-31
Attachment 3	17, including 17a,b,c,d,e,f,g & h	Attachment 9	32-37
Attachment 4	18-23	Attachment 10	38-42
Attachment 5	24-25	Attachment 11	43-45

THE FOLLOWING COMPUTER CODES HAVE BEEN USED IN THIS DOCUMENT:

CODE/VERSION/REV

CODE/VERSION/REV

THE DOCUMENT CONTAINS ASSUMPTIONS THAT MUST BE VERIFIED PRIOR TO USE ON SAFETY-RELATED WORK

YES NO

Record of Revisions

Affected Section and/or Page(s)	Description (Include changes to calculation attachments, microfiche, and electronic media)
Revision 01	Dated December 12, 2003.
Pg 2	Added Record of Revisions page as required by procedure.
Pg 3	Revised Table of Contents page numbers corresponding to calculation sections and attachments.
Attachment 4 (Pg 21)	Revised Section 6.0 to note use of a computer benchmark test case.
Attachment 10 (Pgs 38-42)	Added ALHOA benchmark test case.
Attachment 11 (Pgs 43-45)	Added Design Verification Checklist as required by procedure, effective 11/26/2003.

Valid and current pages: 1-45

Revision 02	Dated January 16, 2004 – new CSS
Pg 2	Added Record of Revisions associated with Revision 2
TOC, Pg 3	Table of Contents – Revised heading for Attachment 3
Sec. 2.0, Pg 4	1 st paragraph, 4 th sentence – inserted '(transmitted)' after "being sent".
Sec. 3.0, Pg 5	For equation 'P', changed 'Missile impact' to 'Missile generation'.
Sec. 5.0, Pg 5	Revised Input/Assumption No.3 – deleted 'and hence will be neglected in the probabilistic evaluation' and added the following: 'If a rupture length is not reported, it is assumed to be zero.'
Sec. 6.1, Pg 5	Revised wording for 'I' (i.e., included the word 'rupture').
Sec. 6.1.1, Pg 6	3 rd paragraph, 6 th sentence –added the following: - '(see Table 1, Note 8)'.
Sec. 6.1.2, Pg 6	1 st paragraph, 2 nd sentence – added 'be' between 'must' and 'an'. Revised the 1st sentence of 2 nd paragraph and revised 'R _{C1} '.
Sec. 6.1.4, Pg 7	Revised 'P _{Explosion} '.
Sec. 6.2, Pg 8	Last sentence, changed 'detonation' to 'explosion' probability and revised 'P _{missile generation} '.
Sec. 6.4, Pg 8	Revised 'P'
Sec. 7.0, Pg 9	Revised yearly probability from 8.08x10 ⁻⁶ to 9.44x10 ⁻⁶ , 2 nd sentence of last paragraph.
Table 1, Pg 11	Revised table input and Notes 1, 3 and 4. Added Notes 5 through 8.
Attachment 3	Revised Pg 17: added reference source information for the table attachment. Also added pages 17a,b,c,d,e,f,g&h – Incidents and Telephonic Records 1998 – 2001 as well as noted this on Pg 17.
Attachment 11	Replaced the Design Verification Checklist for Revision 1 with that for Revision 2.

Valid and current pages: 1-45, including 17a,b,c,d,e,f,g&h