From: TXES6::U096716 "Rachel Tran, C/A Tech Center - 409-238-5565" 26-OCT-1995 16:05:33.6
To: @LOC
CC: U096716
Subj: CHLORINE LOSS OF CONTAINTMENT ASSESSMENT

October 26, 1995

S. Daigle
E. Do Val
R. Eberhagen
B. Guillory
E. Haun
D. Havlik
M. Purdon
G. Wilkinson

cc: B. Cook - Texas
M. Gambrell - Midland
J. Guterman - Aratu
S. Harper - Ft Sask
T. Leigh - Plaquemine
G. Stevens - Texas
F. Schollemann - Stade

SUBJECT: CHLORINE LOSS OF CONTAINMENT ASSESSMENT

As stated in the August 8, 1995 letter by John Young, C/A Tech Center, all of the liquefaction plants should have almost completed step #7. This step calls for the plants to send the final detailed studies and proposed mitigation methods for two identified cases to the CATC for review. Below is the CATC suggested sub-steps which you may find helpful in completing step #7:

1) After the detailed analysis to calculate the "actual amount released", the plant needs to propose additional mitigation methods necessary to limit the total release to threshold limit of 1,000 pounds (step #6). These methods could be modifying the existing methods and/or new methods for the two cases.

2) If necessary, set a meeting with operations and CATC (optional) to discuss all the proposed methods and select only the most effective methods. Some criteria for selection would be to evaluate the benefits, economics, and feasibility of each method.

3) Perform a cost estimate for each of the selected methods.

4) Calculate pounds of chlorine release which would be reduced for each method implemented.

As most of you are aware, I am a new member of the C/A Tech Center and have just taken over responsibilites for this project from John Young. Having been the plant representative for Texas liquefaction plants for this project since last year, I have great appreciation for the work which all of you have been contributing to this assessment. It has been a lengthly but very worthwhile process and we do hope to bring it to a conclusion soon.

T' CATC would appreciate your efforts if you could complete step #7

as suggested above with cost estimates and pounds by November 20, 1995. The CATC will then present your proposals to the Technology Leadership Group (TLG) for evaluation and future plans.

The Tech Center also agreed that no additional work is required from the liquefaction plants in Fort Sask. due to the upcoming project.

If you have any questions and/or comments concerning the loss of containment project, please feel free to contact me at (409)238-5565.

Regards,

Rachel Tran
C/A Tech Center

From: TXES4::U137330 "JOHN YOUNG" 11-AUG-1995 16:18:29.03
To: @LOC
CC: U137330
Subj: CHLORINE MITIGATION- AUTOMATED BLOCK VALVE ASSESMENT

August 8, 1995

J.Guterman - Aratu
T.Leigh - 1601 Plaquemine
G.Stevens - A1230 Texas
F.Schollemann - Stade
S.Harper - 201 Ft Sask

cc: B. Cook
S. Daigle
E. do Val
R. Eberhagen
F. Grell
B. Guillory
E. Haun
D. Havlik
W. Knee
D. Mohrmann
M. Purdon
R. Tran
G. Wilkinson

Chlorine Loss of Containment- Emergency Block Valves

The Technology Centers are responsible and accountable to review our processes and projects to ensure that we have appropriate isolation valving in place. The scope, suggested process and timeline was communicated by Bill Cook in a letter dated 11/30/94.

Bill Cook and I have reviewed the data for cell areas and CDC trains and are satisfied that no additional work is needed for this analysis because the flash calculations for these systems are less than the threshold quantity. A formal letter is in the process of being issued as closure to the appropriate sites.

For liquefaction plants, flash calculations are significantly above the threshold quantity for several sections of the process, and further review for additional mitigation is necessary. The following guidelines should be used when ascertaining the need for and nature of risk reduction measures:

1. For this review, consider only systems in which the total calculated chlorine at risk of being released is greater than 1,000 pounds; the basis for this arbitrary threshold quantity is rooted in management decisions on the tolerability of risks associated with portable one ton cylinders.

2. As a general guideline, mitigation systems should be capable of limiting chlorine losses- for realistic scenarios- to the threshold quantity. Factors such as the chlorine release rate, time required to close isolation valves, operator training, emergency response, etc. must be factored into the evaluation.

3. The intent of this exercise is to identify and manage risk. Solutions should not be limited to installing hardware (valves, scrubbers, etc.); the impact of people issues (such as operator training, emergency planning, emergency procedure, etc.) should also be evaluated for mitigation.

4. Additional mitigation measures should be practical and make good engineering sense. These projects must compete with other projects (TICA, safety, etc.) for the same capital and engineering resources, therefore they should be

prioritized on the basis of cost versus potential pounds mitigated.

To better facilitate the development of additional mitigation strategies and minimize the amount of work required, the implementation process has been revised as follows:

Revised Process

1. Define the quantity of liquid and gaseous chlorine contained between AUTOMATED isolation valves (ABV,EBV,etc).

2. Define Pressure and temperature of each segment.

3. Make a spread sheet of items 1,2 and make a flash calculation for depressure to atmospheric conditions of material contained within the automated isolation, or for the flash of spilled liquid Cl2 from a ruptured vessel.

   NOTE: This calculation assumes that the entire system (between EBV's) is breached.

4. Develop a REALISTIC worst case release scenario for each system identified in step 3 with a calculated flash release greater than 1000 pounds and ESTIMATE the actual release.

   NOTE: The amount released can be significantly impacted by operator response time and the impact of existing mitigation equipment such as manual block valves, scrubber/sniff systems, expansion drums, etc. Do NOT include pool evaporation (liquid chlorine below -34 degC).

5. Select the highest risk scenario in item 4 for TWO cases: (1) distribution piping systems and (2) vessels/process equipment and conduct a more detailed analysis to calculate the actual amount released. For consistency use the following criteria for calculations:

   A. DISTRIBUTION PIPING SYSTEMS: Use a 0.5 inch diameter hole as the default worst case scenario for a gasket leak or hole in the pipe. Large holes in lines due to a shear or an iron-chlorine fire are not considered realistic events for this study.

   B. VESSELS AND PROCESS EQUIPMENT: Use a 0.5 inch diameter hole for a gasket leak, hole in a pipe/vessel/pump, or valve leak. Use an 8 inch diameter hole for a compressor Fe/Cl2 fire. Large holes in vessels or equipment due to a shear are not considered realistic events for this study.

6. For the TWO cases identified in item 6 , site CA plant personnel identify additional mitigation measures necessary to limit the total release amount to 1000 pounds.

7. Send this information to the CATC for review.

8. CATC and site Manufacturing Manager and Superintendants assess whether additional mitigation measures are warranted.

As most of you know, Bernhard Seggert has been named the project manager for the chlor-alkali conversion project in Buna and is no longer with the Tech Center. I have assumed responsibilities for this initiative and will be working with you in the future to bring it to a conclusion. Please direct all related future communications to me.

Please submit item 7 to the CATC by November 1, 1995. If you have any questions please call.

Regards,

John Young
CA Tech Center

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EBV CRITERIA COMPARISON BASED ON VOLUME

Old Criteria

A. Where 5,000 gal (19,000 l), 2,000 gal (7,500 l) if expansion joints, hoses or swivel piping are involved, or more dangerous liquefied gases or an equivalent amount of vapor is inventoried in a single vessel or interconnected vessel.

B. Where 20,000 gal (76,000 l), 8,000 gal (30,000 l) if expansion joints, hoses or swivel piping are involved, or more of flammable or combustible liquid, at or above flash point, is inventoried in a single vessel or interconnected vessels, or where it is possible to be exposed to fire.

New Criteria

A. Where 4,535 kg (10,000 lb) or more of chemicals having an NFPA hazard rating of 4 for flammability, health or reactivity is inventoried in a single or interconnected process or storage tank.

B. Where 45,350 kg (100,000 lb) or more of chemicals having an NFPA hazard rating of 2 or 3 for flammability, health or reactivity is inventoried in a single or interconnected process or storage tank.

For the new criteria 10,000/8.33(0.90) = 1,300 gal
100,000/8.33(0.90) = 13,000 gal