

Rev 06

To: BAJackman, Tech Services Superintendent July 29, 2007

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From: DCHaring, PHA Revalidation Team Leader

Subject: Final Report for Facility Siting Revalidation, K00S0056R1

Summary

The data and findings of the 2005 revalidation meetings have been updated with respect to current facility operation with Plants 1 and 2 shut down, and reviewed with team members. Eight recommendations, included below, were compiled in the 2005 team meeting and recently reconfirmed. They resulted from a review of the previous studies, incidents, changes, and additional concerns.

The team meeting for the facility siting revalidation was held on June 28, 2005 for the original study that was conducted between March 1997 and March 1998. A core team of 5 people participated full-time on the revalidation, and another 5 contributed as needed.

The team believes that 10 of the original EQE recommendations (listed in an attachment) are complete or adequate; they have not been duplicated in this letter. The other three original EQE recommendations need further attention, and are included below along with three recommendations stemming from PHA review of other resources. A total of six recommendations resulted from this revalidation. They resulted from a review of the previous studies, incidents, changes, and additional concerns. Though additional review of contractor calculations was needed, the issue of restricting contractor assembly areas in process facilities was presented to the Turnaround Management Team for use during the 2005 turnaround.

The recommendations were updated in 2006 to account for the change in operating philosophy with Plants 1 and 2 shut down.

The attached spreadsheet documents all the recommendations from the revalidation, including the original EQE recommendations, current status, and current recommendations.

Background

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The only documentation found for the original facility siting study was the draft report by EQE, which included 3 separate studies. EQE generated an initial study with 13 recommendations, and then was contracted to provide additional technical assessment. No notes of team review, final or summary report, list of recommendations, or documentation of management action on any recommendations were found.

Since no documentation of review of recommendations from the EQE draft report was found, a summary of recommendations from that report was prepared. Additionally, the risk numbers were checked for accuracy and then updated to account for actions taken since 1998. Then the risk ranking that EQE used was translated into the Agrium risk ranking matrix for consistency in evaluation.

Recommendations

1. **Original recommendation:** Ref. 2: ensure all windows in process area are constructed from reinforced glass for blast protection.
Action Taken: Windows were changed after the original facility siting PHA to reinforced glass, for blast protection. This has not been established as plant policy, so unreinforced glass may be in service again.
New Recommendation: Establish a plant policy for use of reinforced glass within the facility. Document it on the intranet as a safety measure. Discuss the need to maintain safety glass in the plant with department heads, tech services staff, and purchasing personnel.
2. **Original recommendation:** Ref. 11: maintain the designed electrical classification by continuing to use proper, specified materials in electrically-classified areas.
Action Taken: An audit was conducted of the ammonia compressor buildings several years ago. Many deficiencies were found and corrected.
New Recommendation: Establish an annual audit of electrically classified areas (compressor buildings and gas buildings), to ensure that proper materials are being used and the equipment remains in a condition that does not change its classification. Note that improper repair, sealing, or use of unlisted components has been an item of interest during PSM and OSHA audits in the past.
3. **Original recommendation:** Ref. 13: check to see if KNO has adequate emergency response plans for each type of release of toxic materials which are included on-site; plan to address Shelter-In-Place plans and resources.
New Recommendation: Same as original.
4. **New Recommendation:** [from discussion] The “mutual-aid partner” plan has not been updated in some time, and is not included in the Emergency Response Manual. Update the plan, and include it in the manual.
5. **New Recommendation:** [from discussion] Operations personnel noted that there was insufficient firewater to respond as desired for the fire in the Plant 4 compressor building. Evaluate whether this is still the case and whether changes need to be made.
6. **New Recommendation:** [from discussion] Stemming from the BP incident and the EQE study, the team recommended that a plant policy be established for

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locating contractors and contractor shelters in or adjacent to process areas. Document this policy in AP-8 (Contractor Management) and SWP-11 (Control of Personnel in Process Areas). The EQE study focused on the result of overpressure due to explosion. The policy should specifically exclude contractors from areas in or adjacent to an ammonia plant during start-up or shutdown of an ammonia plant (the Peak dome was specifically mentioned as needing to be vacated during these periods). Some safeguards may also be prudent when groups of personnel are located close by and the urea plant is starting up or shutting down. Further note (12/2006): the Peak dome has since been removed, and assembly location of contractors was addressed for the 2005 turnaround.

Information Reviewed

The team reviewed the following in addition to the previous study, and incorporated the information into recommendations as appropriate:

- Pertinent MOC's and other changes
 - new Cogen unit
 - new 3rd Air Compressor
 - new PEAK dome tent for contractors (2006 note: removed)
 - new check valves after 1F109 explosion (2006 note: Plant 1 is O/S)
 - Training trailer – empty and about to be removed (2006 note: removed)
 - Engineering trailer – removed
 - P&C trailer – removed
 - Procedures trailer – removed
 - Ops Eng trailer – removed
 - T/A Trailer – removed
 - Plant 2 Control Room – empty; plant has been shut down
 - Fairbanks-Morse generator building has been shut down
- Incidents
 - Internal to KNO: 1F109 tank explosion
 - External: BP-Texas City refinery explosion of 2005
 - External: 9-11 terrorism
- Revalidation worksheet questions
- The 3 EQE studies, data and recommendations dated May 1997, October 1997, and March 1998. Note that the EQE risk rankings required translation. Their individual risk evaluation was premised on the likelihood of one fatality, so a severity of C was used and all their probabilities were inverted to allow direct use of the Agrium risk ranking matrix. Likewise, EQE's multiple risk evaluation was premised on the likelihood of more than one fatality, so a severity of B was used.
- RMP/offsite applicability (determined to be none).

Findings and Data Reconciliation

Considerable time was spent reconciling the EQE recommendations, which had assumed high (Corporate 3 scale) likelihoods of control room destruction and multiple fatalities in the unlikely event of various buildings or vessels exploding. Outcome frequencies were

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extracted from the various EQE reports and compiled on one spreadsheet to aid in reconciling the recommendations.

Their summary from the March 1998 report, when used with the Agrium Corporate Risk Matrix, yielded high-hazard H2 risks for control rooms in Plant 1, Plant 2, and Plants 4/5. Their data was input into a spreadsheet in order to check for accuracy and update it for changes that had been made in the intervening period.

EQE's risk numbers roughly agreed with our calculations, except for Plant 4 (which they had at higher risk than calculations supported). With the shut-down of Plants 1 and 2, abandonment of the Fairbanks-Morse building, and the building change of use from the heavily-occupied PSM Building to the lightly-occupied Safety Building, *the risks changed for the Plant 1 Control Room*. Risks are now no higher than M.

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