

Attachment 2

From: Alex Murray
To: Joseph Giitter; Joseph Holonich; Robert Pierson
Date: 2/5/04 6:49PM
Subject: Further Thoughts on Red Oil

All,

In our meeting about Red Oil on January 16th, I was asked to comment on the review process for MOX (and red oil in particular) and what I would consider acceptable for red oil. My comments and recommendations follow,

Alex.

MOX Review Process:

A partial list of summary observations from the past three years.

Applicant :

1. Limited information provided in original CAR.
2. Approaches often different from accepted analogs (e.g., DOE, codes), fewer controls, more risk based than risk-informed, performance based, frequently no supporting calculations
3. Multiple changes in approach, design bases - from CAR, to RCAR, to meetings. For red oil, the DCS approach was not really finalized until Spring 2003 for open systems and August 2003 for closed systems
4. Discrepancies and differences rarely addressed first time or adequately - "fundamental approach" for red oil has not materialized.
5. Submittals/approaches often are assertions without supporting information/references, calculations
6. Information, references/citations, calculations often not provided with submittal or in a timely manner
7. Sometimes reluctant to provide information (e.g., DOE, French experience), particularly when it disagrees with the DCS approach. The July meeting is a good example for red oil.
8. Sometimes, the focus is on language/semantics in submittals ("design basis like Fauske")
9. Not prepared for meetings, writeups/submittals inadequate/inconsistent/change
10. There are multiple, competing groups within DCS - e.g., licensing sometimes seems decoupled from design group

NRC :

1. Allowed meetings without receipt of information prior to meeting, applicant unprepared
2. Scheduled meetings when Lead Chemical Safety Reviewer unavailable
3. Acceptance criteria from SRP often diluted, alternatives not supplied
4. Burden not placed on Applicant (e.g., per PM manual)
5. Management perception of two part licensing - first part faster, OK because of "second bite at the apple."
6. Consensus process - conclusion often provided by management, then staff asked.
7. Tracking system and backup documentation not adequate.

Both:

1. Chemical safety underappreciated

Red Oil:

The applicant's proposal for open systems was finalized in the Spring of 2003. Limited information was supplied by DCS to support the assertion of a preventative strategy capable of attaining a "highly unlikely" likelihood. The staff review included checking with analogs (DOE and France), literature citations, and

DOE/DNFSB colleagues. The staff also conducted a top-level fault tree analysis. Staff concluded that the approach for controlling red oil events in open systems had the ability to be implemented to meet Part 70 requirements (70.61 on Performance Requirements and Baseline Design Criteria 3 and 5 [fire/explosion and chemical]) and, thus, was acceptable for the construction authorization phase.

The applicant finalized their approach for closed systems in August 2003 after several changes from the RCAR submittal (October 2002). The proposal is different from the July 2003 public meeting where discussions indicated what would be acceptable to the staff. The applicant's submittal does not include any information, references, or calculations to support the assertion of meeting Part 70 requirements. DNFSB also released a document on appropriate controls for preventing red oil events in late 2003. The staff review included checking with analogs (DOE and France), literature citations, and DOE/DNFSB colleagues. The staff also conducted a top-level fault tree analysis which expressed concerns about accuracy of the temperatures and approach. I concluded that the approach for controlling red oil events in closed systems did not have the ability to be implemented to meet Part 70 requirements (70.61 on Performance Requirements, and 70.64(a) on Baseline Design Criteria 3 and 5 [fire/explosion and chemical]) and, thus, was not acceptable for the construction authorization phase. I concluded additional discussions with and information from the applicant are needed to adequately address this issue - fundamentally, how is adequate safety assured when a system that has significantly less venting capability is allowed to have a temperature design basis some 5 C higher than an open system, and where 90%+ of the heating accrues from the red oil reactions?

Several members of the staff also had similar concerns. However, in a meeting, management asked for a vote on the acceptability of the red oil response for closed systems. Management voted first, in favor of acceptance. I was the only one willing to vote non-acceptance in front of management. No one else was willing to express their concerns in front of management. My position and rationale were well received at the ACRS meeting of November 6, 2003.

I conclude adequate assurances of safety can be achieved by a lower design basis temperature (say, 110-115 C) and more venting capability (all other controls remaining the same), or by DCS following the DOE control strategy. I conclude DCS would be unable to provide adequate assurances of safety for their current safety strategy for closed systems in a timely manner, based upon their interactions with the NRC to date. Fundamentally, the NRC needs to function as a regulatory agency and take charge of the situation. I would like to see a letter from FCSS management go to DCS that communicates this and get the proverbial ball rolling - say, something like the following:

"The NRC has been reviewing the issue of potential solvent-nitrate (red oil) interactions at the proposed facility for almost three years, and the staff has had numerous interactions and meetings with DCS on the subject. The DCS strategy and design bases have changed several times. In the Spring of 2003, DCS proposed a definition and safety strategy for open systems using active engineered and administrative controls. Staff reviewed the situation and concluded the safety strategy, PSSCs, and safety functions provided reasonable assurances of safety, and the only remaining item concerned the design basis. After additional clarifications, DCS provided a design basis. After review, the staff concluded this provided adequate assurances of safety for prevention of the red oil phenomena in open systems and would be acceptable for construction authorization under Part 70."

"In August 2003, DCS provided another change to its safety strategy for preventing the red oil phenomena in closed systems. The submittal did not include any information, references, or calculations to support the assertion of meeting Part 70 requirements. The staff review included checking with analogs (DOE and France), literature citations (including a recently released DNFSB document on controls for red oil), and DOE/DNFSB colleagues. The staff also conducted a top-level fault tree analysis which expressed concerns about accuracy of the temperatures and approach. The staff has concluded that the information for the approach proposed by DCS for controlling red oil events in closed systems does not have the ability to be implemented to meet Part 70 requirements (70.61 on Performance Requirements, and 70.64(a) on Baseline Design Criteria 3 and 5 [fire/explosion and chemical]) and, thus, this is not acceptable for the construction authorization phase. Fundamentally, how is adequate safety assured

when a system that has significantly less venting capability is allowed to have a temperature design basis some 5 C higher than an open system, and where 90%+ of the heating accrues from the red oil reactions?"

"Additional information is needed from DCS to address this red oil issue for closed systems. The staff has concluded adequate assurances of safety can be achieved by a lower design basis temperature (say, 110-115 C) and more venting capability (all other controls remaining the same), or by DCS following the DOE control strategy, as outlined in the recent DNFSB report. Alternatively, DCS can provide additional assurances on their current approach. However, I have concerns that DCS would be unable to provide adequate assurances of safety for their current safety strategy for closed systems in a timely manner, based upon their interactions with the NRC over the past three years."

"This information needs to be submitted to the NRC in a timely manner to allow for adequate review by the staff, preferably within the next 30 days."

A letter like this should be followed up with a phone call on the subject.