This document is being submitted to help address the question on Delay of Repair. These come from Dow comments submitted to EPA on the proposed rule.

Comment #24 – From Dow Comments on Proposed HON Rule

24. EO Equipment Leaks: Delay of Repair: The Delay of Repair provisions should continue to be allowed for pumps, valves, and connectors in ethylene oxide service.

Proposed §63.171(f) notes that Delay of Repair is not allowed for light liquid pumps in ethylene oxide service, gas/vapor and light liquid valves in ethylene oxide service, and connectors in ethylene oxide service.

We share EPA's goal of finding and repairing fugitive emission sources of ethylene oxide in a timely manner. However, it is also important that the final rule includes the ability to use the Delay of Repair provisions, if necessary. In some cases, it is better to not shutdown a process unit or part of a process unit/area to repair a minimal number of components that may need to be placed on Delay of Repair. Additional information on this topic is provided in the following paragraphs.

As shown in our site responses to the Section 114 request in 2022, the number of components that were on Delay of Repair with a 500 ppmv leak definition was very small during RY2017 with the some of our sites having zero and some up to three valves on the Delay of Repair list. Although the HON rule proposes to lower the leak definition to 100 ppmv, we do not expect that the number of components that will need to be placed on Delay of Repair will increase significantly. However, we do expect that there will be some isolated cases where it may not be possible to repair a leaking pump, valve, or a connector without taking a portion or the entire process unit out of service.

The act of taking a process unit or part of a process unit out of service typically consists of purging process fluids from a section of the process or the entire process, which typically results in VOC and some HAP emissions from emission control equipment such as flares, thermal oxidizers, scrubbers, or other control devices. Then, the maintenance work will need to be conducted to repair or replace the leaking component, and then the process unit or part of a process unit will then re-start operations. Taken together, we expect that the emissions from taking systems out of service and then re-starting them will create more emissions than addressing a single leaking component or a small number of leaking components that are on the Delay of Repair list.

Examples illustrating this concern are provided below:

Leak Rates for Components on Delay of Repair

One valve (light liquid service with 100% ethylene oxide) that is leaking at 100 ppmv has a calculated fugitive emission rate of 0.00055 lbs/hr or 4.8 lbs/yr (if this component is on the DOR list for an entire year). It should also be noted that since the LDAR program may be extended to equipment with an EO concentration possibly as low as 0.1 wt% that a component on Delay of Repair may also be on process line where the concentration of EO is substantially lower than 100%, and thus the leak would be primarily other hydrocarbon compounds such as ethylene. For example, one valve (gas vapor service with 2wt% ethylene oxide) that is leaking at 100 ppmv has a calculated fugitive emission rate of 0.0002 lbs/hr of total hydrocarbons x 0.02 = 0.000004 lbs/hr of ethylene oxide.

Emissions Associated with Shutdown/Purging Materials

The emissions of purged material from immediate repair depend on where a leaking component is located in the process, but the emissions of purged material are calculated to be the following for each process unit shutdown from two of our ethylene oxide plants:

Plant 1 – Emissions from the Flare Point - Approximately 1.2 pounds of ethylene oxide and 13 pounds of ethylene along with additional NOx, CO, and CO_2 emissions from a flare.

Plant 2 – Emissions from the Flare Point - Approximately 1.03 pound of ethylene oxide and 54 pounds of ethylene along with additional NOx, CO, and CO_2 emissions from a flare.

It is not possible to determine how many additional unplanned outages may be necessary to address leaking components over the course of a year, but we suggest that our plants should avoid these additional air emissions due to shutdown venting. There are also additional air emissions during the start-up of these facilities.

Thus, we encourage EPA to continue to allow the Delay of Repair provisions to be available for components that are in ethylene oxide service, and to not finalize the proposed §63.171(f) provisions.

We also want to highlight to EPA that our covered HON CMPUs that produce and use ethylene oxide as a raw material will typically have a planned process shutdown every two to three years depending on the specific process. Thus, we would not expect a small number of component(s) to be on the Delay of Repair list for an extended period of time. In addition to the example provided above, an internal operating goal is to minimize the number of shutdown and start-up actions for our HON covered CMPUs as these conditions do not represent steady-state operating conditions and sometimes operating problems can occur during the transient operating conditions associated with plant shutdowns and subsequent start-ups.

Recommendation:

Dow recommends the following revisions to EPA's proposed changes to 63.171.

§63.171 Standards: Delay of repair.

(a) ~~Except as specified in paragraph (f) of this section, Dd~~~~delay~~ Delay of repair of equipment for which leaks have been detected is allowed if repair within 15 days is technically infeasible without a process unit shutdown. Repair of this equipment shall occur by the end of the next process unit shutdown.

(b) ~~Except as specified in paragraph (f) of this section, Dd~~~~delay~~ Delay of repair of equipment for which leaks have been detected is allowed for equipment that is isolated from the process and that does not remain in organic HAP service.

(c) ~~Except as specified in paragraph (f) of this section, Dd~~~~delay~~ Delay of repair for valves, connectors, and agitators is also allowed if:

(1) The owner or operator determines that emissions of purged material resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair, and

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with §63.172 of this subpart.

(d) ~~Except as specified in paragraph (f) of this section, Dd~~~~delay~~ Delay of repair for pumps is also allowed if: (1) Repair requires replacing the existing seal design with a new system that the owner or operator has determined under the provisions of §63.176(d) of this subpart will provide better performance or: (i) A dual mechanical seal system that meets the requirements of §63.163(e) of this subpart,

(ii) A pump that meets the requirements of §63.163(f) of this subpart, or

(iii) A closed-vent system and control device that meets the requirements of §63.163(g) of this subpart; and
(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.

(e) ~~Except as specified in paragraph (f) of this section, D~~~~delay~~ Delay of repair beyond a process unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the second process unit shutdown will not be allowed unless the third process unit shutdown occurs sooner than 6 months after the first process unit shutdown.

~~(f) For each source as defined in §63.101 of subpart F of this part, and for each source as defined in §63.191 of subpart I of this part, beginning no later than the compliance dates specified in §63.100(k)(11) of subpart F of this part, delay of repair is not allowed for light liquid pumps in ethylene oxide service, gas/vapor and light liquid valves in ethylene oxide service, and connectors in ethylene oxide service.~~