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In reply, please refer to:
File:

August 4, 2023

Vice Admiral John Wade
Joint Task Force, Red Hill
1025 Quincy Avenue, Suite 900
Joint Base Pearl Harbor Hickam, Hawai'i 96860-5101
[via email only: john.f.wade2.mil@us.navy.mil]

Dear Vice Admiral Wade:

SUBJECT: Response to "JTF-RH's Responses to DOH's Requests for Information Regarding Issues Concerning Consistency in the Red Hill Bulk Fuel Storage Facility Defueling Plan Supplement 1.A," dated May 31, 2023

On May 31, 2023, the Hawai'i Department of Health (DOH) received the subject letter from the Joint Task Force – Red Hill (JTF-RH) in response to our April 14, 2023 email regarding surge analysis and mitigation (Reference c). In addition to the responses enclosed in your letter, we received the following supporting documents:

- Reference a: Simpson Gumpertz & Heger, Inc. (SGH) memorandum, subject "Red Hill Fuel Pipelines - Surge Assessment," dated January 17, 2023;
- Reference b: JTF-RH responses to "Additional EPA Comments on the Red Hill Bulk Fuel Storage Facility (RHBFSF) Consolidated Repair/Enhancement List (October 24, 2022);"
- Reference c: DOH email, subject "Issues concerning consistency within Defueling Supplement 1," dated April 14, 2023;
- Reference d: SGH memorandum, subject "Red Hill Fuel Pipelines – Updated Surge Response Analysis," dated May 10, 2023, revised May 16, 2023;
- Reference e: Risktec memorandum, dated May 16, 2023; and
- Reference f: JTF-RH revised "Release Event Tree Analysis."

The JTF-RH's responses to our comments also referenced the following documents:

- Enterprise Engineering, Inc. (EEI), "Hydraulic Analysis and Dynamic Transient Surge Evaluation, FISC Pearl Harbor Fuel System, Pearl Harbor, Hawaii, Final Report," dated September 2010 (EEI, 2010);
- EEI, "FY21 Emergent Pipeline Repair Red Hill, Pipeline Stress Analysis and Structural Evaluation Report – Red Hill Lower Access Tunnel," dated September 2022 (EEI, 2022); and

- SGH, "Final Assessment Report," dated April 29, 2022 (SGH, 2022).

Additionally, based on a July 11, 2023 email from the Fleet Logistics Center (FLC), as well as meetings with the JTF-RH and FLC on July 12, 2023 and July 14, 2023, we understand that "during nearly 70 years of operation, the components have routinely operated at pressures up to (b) (3) (A) psig [pounds per square inch gauge] (deadhead of two UGPH [underground pumphouse] pumps in series) – **we will experience lower pressures during our gravity draining of the Red Hill Tanks** [emphasis in original]…."

Given the JTF-RH's May 31, 2023 submission, the additional referenced documents listed above, the FLC's July 11, 2023 email quoted above, and meetings with the DOH, U.S. Environmental Protection Agency, JTF-RH, and FLC on July 12, 2023 and July 14, 2023, the DOH's understanding is as follows:

- EEI (EEI, 2022) and SGH (Reference d) calculated the maximum allowable surge pressures (basic and occasional, psig) for the lower access tunnel (LAT) to be (b) (3) (A) psig and (b) (3) (A) psig for the JP-5 line and F-24 line, respectively.
- For the pipelines between the UGPH and LAT, the JTF-RH and FLC calculated the maximum allowable surge pressure and maximum operating pressure to be (b) (3) (A) psig and (b) (3) (A) psig, respectively. The calculations were based on previous routinely operated pressures of up to (b) (3) (A) psig (b) (3) (A) and (b) (3) (A) factor of safety. Per American Society of Mechanical Engineers (ASME) B31.3, a pressure exertion should not be more than 33% above the maximum operating pressure. Therefore, (b) (3) (A) psig of maximum operating pressure. Increasing (b) (3) (A) psig by 33% results in (b) (3) (A) psig for the maximum allowable surge pressure.
- Because the maximum allowable surge pressures were not recently calculated for other portions of the system, the maximum allowable surge pressures presented in the EEI 2010 report that accompany the tables in Risktec's memorandum (Reference e) are also applicable to the JTF-RH's evaluation.
- For the proposed defueling scenario of gravity flow from the Red Hill tanks to Hotel Pier, Risktec identified EEI 2010 model cases (b) (3) (A) and (b) (3) (A) as most applicable to the JP-5 and F-24 lines, respectively. Under these scenarios, the stated maximum expected surge pressures in the LAT are (b) (3) (A) psig and (b) (3) (A) psig for the JP-5 and F-24 lines, respectively. There were other sub scenarios under scenarios 4 and 7 with calculated surge pressures above those allowable values, which the JTF-RH indicates will be mitigated through operations.
- The maximum allowable working pressures, based on the maximum calculated surge pressures, as presented in the JTF-RH's response, are (b) (3) (A) psig and (b) (3) (A) psig for the JP-5 and F-24 lines, respectively. The maximum expected working pressures associated with the planned gravity-based defueling operations in the LAT are (b) (3) (A) psig and (b) (3) (A) psig for the JP-5 and F-24 lines, respectively.

We also understand the JTF-RH concurred with SGH's (SGH, 2022) and EEI's (EEI, 2022) recommendations to complete repairs to increase resiliency against surge, which were included in the original "Consolidated List of Repairs for Safe Defueling," submitted on October 24, 2023. However, SGH appears to have revised its original design criteria for Repair Nos. 10 and 11 (SGH.LAT.20 and SGH.LAT.24), based on SGH's memorandum, dated November 30, 2022

(revised June 23, 2023), which the JTF-RH submitted with those quality validation reports on June 26, 2023.

Page 3 of SGH's November 30, 2022 memo provides "[a] revised estimate of the maximum surge pressure of [redacted]psi [pounds per square inch] for the F-24 pipeline based on planned defueling flow rates and a maximum operating pressure of [redacted]si." SGH also notes "LAT-24 includes recommendations for multiple pipe supports per SGH retrofit concept drawings in Appendix A.3 of our April 2022 report." SGH then states "[t]his surge pressure is less than half the surge pressure evaluated in our April 2022 assessment since the collapse of vacuum-based surges will be mitigated through operational changes." While this change remains within the current design criteria for surge mitigation, it reduces the resiliency referenced in your May 31, 2023 response and may affect your release event analysis.

We understand from our meeting on July 12, 2023, that the original basis of design was not changed for any other repair.

Please confirm in writing that our understanding is correct. If our understanding is correct, then the DOH does not have additional comments regarding the planned surge mitigation design, provided that the JTF-RH does the following:

- To minimize surge, provide and implement operations plans (CONOPs, OPORDs) that incorporate the planned mitigation efforts, as described in the JTF-RH's May 31, 2023 submission, SGH's and EEI's design assumptions, EEI's 2010 report, and associated documents.
- Notify the DOH if there are any other design or operational changes that affect the design for surge mitigation or resiliency. Let us know as soon as possible, so that we may discuss any potential concerns.

If you have any questions regarding this letter, please contact Ms. Kelly Ann Lee, Red Hill Project Coordinator, at (808) 586-4226 or kellyann.lee@doh.hawaii.gov.

Sincerely,

Kathleen Ho

KATHLEEN S. HO
Deputy Director for Environmental Health

c: Mr. Grant Scavello, U.S. Environmental Protection Agency [via email only]
Mr. Evan Osborne, U.S. Environmental Protection Agency [via email only]
BG Michelle Link, JTF-RH [via email only]
LTC Noor James, JTF-RH [via email only]