



# (U) Use of AFFF Retention System as Spill Mitigation for lower tank gallery

ING A FREE AND OPEN INDO-PACIFIC

## Summary

### **Issue:**

- Regulatory Agencies pushing for the use of the AFFF retention system as a contingency option for a fuel spill in the tank gallery. Use of the AFFF retention line presents several risks to schedule and the water resource.

### **Course of Action:**

- Evaluate the technical requirements and coordinate concurrence with the regulatory agencies
- Execute contract actions to perform needed modifications to the existing systems

## Nature of Brief

Informational brief on two COAs for using AFFF retention as a contingency for spill response in the tank gallery.

## Background

- AFFF will likely not be used for fire protection at RHBHSF
- DOH and EPA have indicated that use of the AFFF retention line would be beneficial in the event of a fuel spill and/or discharge of AFFF
- Repairs to the existing AFFF retention system within the target defuel timeline make it difficult to test and confirm effectiveness
- Routing the AFFF retention through the abandoned F-76 line may be more effective as well as mitigate known risks

## Desired Outcome

- Find a solution to reduce risk of further contamination of the water resource
- Provide a more reliable option to transport and temporarily store of fuel in the event of a fuel spill
  - Maintain repair schedule to meet defueling timelines
  - Establish limits to the application of industry standards and regulatory authority on a contingency system



# (U) Use of AFFF Retention System as-is

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## Summary

Repairs and Maintenance:

- Caulking joints with jet fuel resistant sealant
- Plug and cap the damaged low point drain
- Provide administrative controls to prevent future damage to low point drains
- Repair/adjust pipe supports
- Repair/Replace the 'belly pump' at Adit 3
- Test AFFF sump pumps and repair as needed

## Benefits

- Repairs and maintenance currently in progress and are likely to be complete by end of June 2023

## Concerns

- Multiple potential points of failure with caulking the obviously compromised couplings. While a catastrophic failure is unlikely, there is still possibility of caulking failures. There are a lot of couplings, not just in the area of Adit 3
- AFFF sump pump repairs still unknown; awaiting testing
- Recovery of fuel from the 'belly pump' at Adit 3 is burdensome.
- The AFFF recovery tank is a top inlet tank, which goes against fuel tank design. There is a danger of static electricity ignition when filling a tank this way.



# (U) AFFF Retention System

Activity: Use of AFFF retention system as contingency spill mitigation

- Weeping at couplings – likely probability and marginal severity: Moderate Risk
- Failure of belly pump or delays to recovery at Adit 3 – unlikely probability and marginal severity: Low Risk
- Damage to AFFF retention line while awaiting removal at Adit 3 – Unlikely probability and catastrophic severity: Moderate Risk

### ➤ Mitigations:

- Pipeline will be walked and inspected for weeping periodically until drained
- Spill kits and absorbent pads at the ready
- Vac trucks on standby at Adit 3

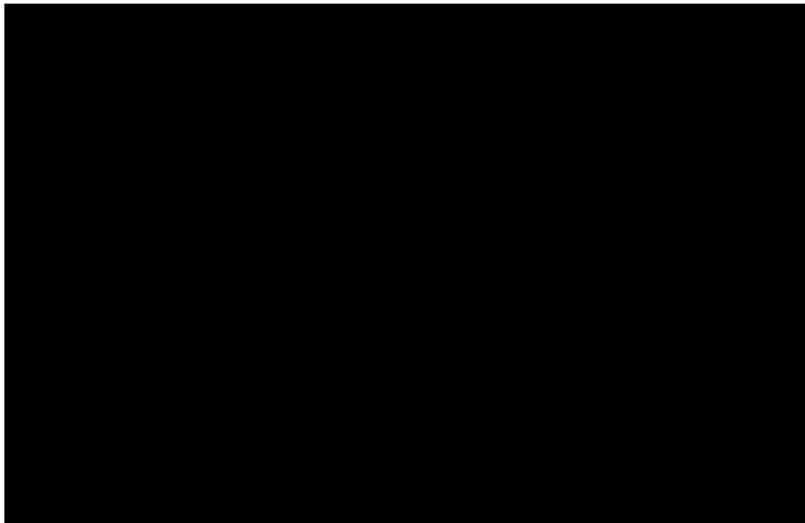
Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
<b>Step 1:</b> Review each Hazard with identified "Controls". Determine RAC (see above).					
<b>RAC CHART</b>					
Probability: Likelihood the activity will cause a Mishap (Near Miss, Incident, or Accident). Identify as Frequent, Likely, Occasional, Seldom or Unlikely			<b>E = Extremely High Risk</b>		
Identify as Catastrophic, Critical, Marginal, or Negligible			<b>H = High Risk</b>		
<b>Step 2:</b> Identify the RAC (probability vs. severity) as E, H, M, or L for each "Hazard" on AHA.			<b>M = Moderate Risk</b>		
Annotate the overall highest RAC at the top of the AHA			<b>L = Low Risk</b>		

**Activity risk is Moderate**



## (U) Connecting to the F-76 pipeline

ING A FREE AND OPEN INDO-PACIFIC



### Summary

- Jump the [REDACTED] PVC AFFF retention line over to the steel F-76 pipeline in the tank gallery.
- F-76 pipeline was last used for bulk fuel movement during unpacking operation
- F-76 pipeline was established to be liquid tight in April due when residual fuel was removed from the F-24 line.
- Use of the F-76 pipeline mitigates several risks identified for the use of the hybrid Steel-PVC AFFF retention line

### Benefits

- Steel construction to POL system standards
- [REDACTED] volume capacity vs. [REDACTED] for AFFF retention pipe and AFFF retention tank combined.
- Recovery effort is same as UGPH draining CONOP and can be executed at same time.
- Routing the AFFF retention through the abandoned F-76 line may be more effective as well as mitigate known risks with the existing AFFF retention pipeline.

### Concerns

- DOH and EPA concurrence that this is contingency option, not subject to burdensome testing and certifications. Their requirements could jeopardize schedule feasibility
- A suitable contract vehicle needs to be established for execution. NAVFAC is currently working options.
- Completion before repacking in August may be difficult, but completion before defueling is reasonable.
- This option is only viable after official decision to not use AFFF is made.



# (U) AFFF Retention crossover to F-76

Activity: Use of AFFF retention system as contingency spill mitigation

- Weeping at couplings – unlikely and marginal severity: Low Risk
- Delays to recovery at UGPH – unlikely and negligible severity: Low Risk

Risk Assessment Code (RAC) Matrix					
Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
<b>Step 1:</b> Review each Hazard with identified "Controls". Determine RAC (see above).					
<b>RAC CHART</b>					
Probability: Likelihood the activity will cause a Mishap (Near Miss, Incident, or Accident). Identify as Frequent, Likely, Occasional, Seldom or Unlikely					
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<b>Step 2:</b> Identify the RAC (probability vs. severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of the AHA					
E = Extremely High Risk					
H = High Risk					
M = Moderate Risk					
L = Low Risk					

### ➤ Mitigations:

- Pipeline will be walked and inspected by rovers on typical schedule
- Spill kits and absorbent pads at the ready

**Activity risk is Low**

# ***BACKUP***





## (U) AFFF Retention System

- AFFF retention system successfully held approximately [REDACTED] of fuel between the 6 May 2021 and 20 Nov 2021 events.
- Based on assessments, repairs are required to the AFFF retention system
  - Plug damaged low point drain **COMPLETE**
  - Provide administrative controls to prevent future damage to low point drains **COMPLETE**
  - Fuel resistant caulking/sealing of all couplings **IN PROGRESS**
  - Repair/Adjust pipe hangers **IN PROGRESS**
  - Repair Adit 3 'belly pump' to facilitate draining of low point **IN PROGRESS**
  - Test and Service AFFF sump pumps **IN PROGRESS**
- There is visible stains at the coupling seals through the AFFF retention line. DCBL assessment is to assume that the line is compromised. The action to apply fuel resistant caulk may not be 100 effective against sustained pressurization ([REDACTED]).
- DOH has indicated requirement to test the AFFF retention line. [REDACTED] to determine a suitable testing solution. Hydro testing will generate [REDACTED] fuel contaminated water that will need to be disposed of via the Adit 3 belly pump.
- DOH have been informally notified that JTF is not planning on the use of AFFF as part of the response plan in the event of a fire. [REDACTED]
- NAVFAC EXWC and DCBL advise against trying to certify the AFFF retention system as a fuel handling system.



## (U) F-76 pipeline

- The F-76 pipeline has been used as recently as 14 Apr 2023. No problems were observed. No problems were observed during unpacking. Pipe integrity appears to be good.
- We have reviewed the repair assessments from NDAA (ABA) and SGH. While several repairs to F-76 were identified, no additional repairs are needed to the official list of 253 to support using this under gravity conditions as a contingency measure.
- Sectional valves on the F-76 pipeline allow for isolations, if necessary
- Volume capacity [REDACTED] of F-76 pipeline far exceeds that of the AFFF retention [REDACTED] and collects at UGPH, where it can be combined with the UGPH draining CONOP.
- SGH, NAVSUP FLCPH, NAVFAC EXWC, and NAVFAC DCBL all support the use of the F-76 pipeline over the AFFF retention system as a contingency option in the event of a fuel spill in the tank gallery.





## (U) Technical Considerations

- [REDACTED] flow rate (4 x [REDACTED] Pumps). Need pipe supports for reactionary forces. Recommend limiting to 2 pumps and max [REDACTED].
- Account for possibility of residual upstream fuel
- Venting of displaced air required
- Transition from PVC to Steel piping material. Transition from [REDACTED] for more standard/available materials? Grooved joint fittings for ease of install and demo? Extra blinds/cap on hand?
- Contingency option – not a regulated fuel handling system subject to testing and construction standards
- Simplified design and construction to avoid delays
- Limited pressures will be seen due to low to medium volumes. 20,000 gallons will not pressurize the AFFF retention header because it will discharge into the open F-76 line.
- Testing and maintenance of AFFF sump pumps in progress
- Weeping at the AFFF pump risers is likely not an issue because it would return a small amount to the area affected by the spill anyways.
- Additional minor spill mitigations may be required



[REDACTED]

## (U) Discussion with Regulatory Agencies

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- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]



[REDACTED]

## (U) Discussion internal to DoD



- [REDACTED]

- [REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED]



## (U) Status of AFFF retention

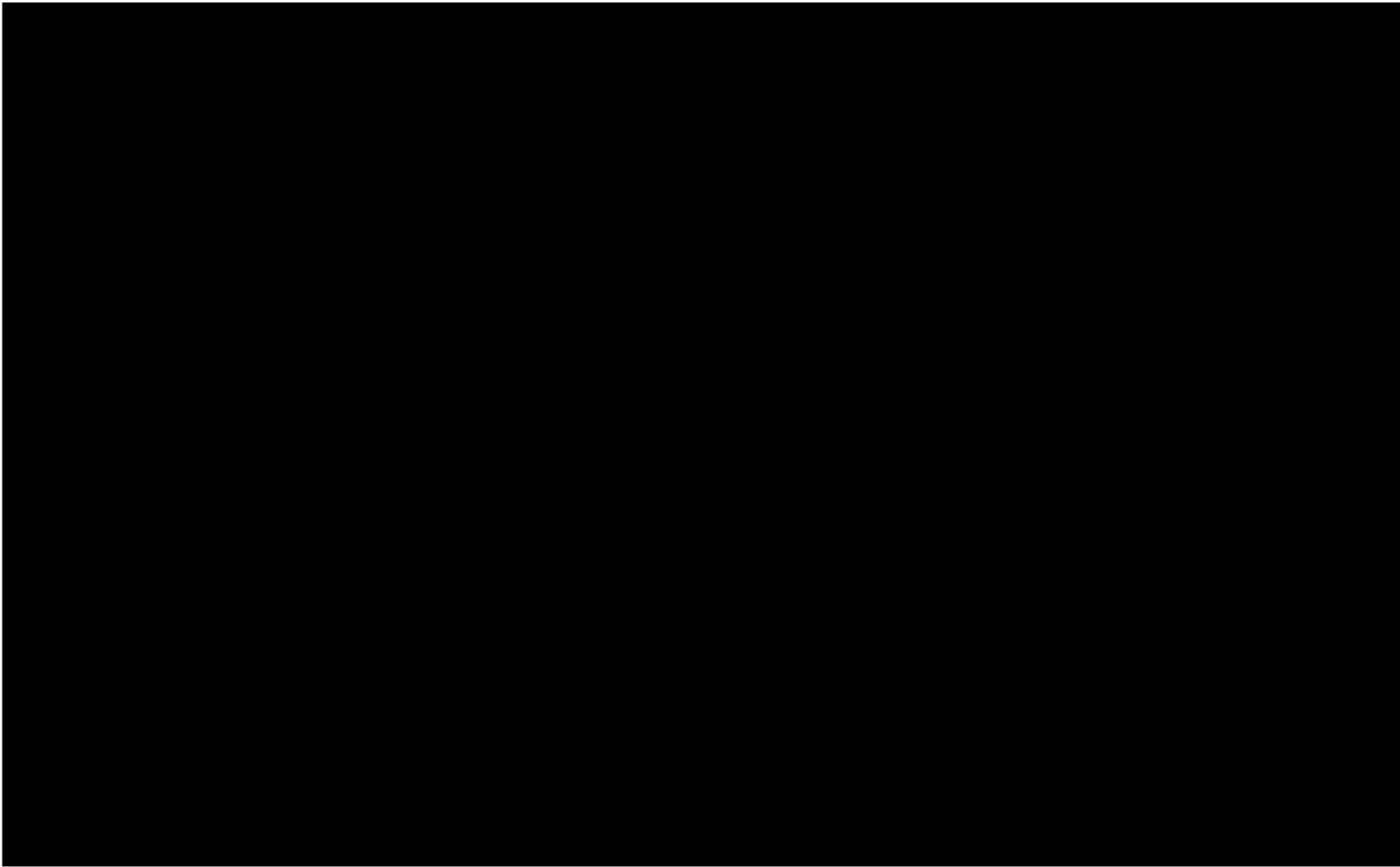
- Caulking at all couplings
  - Caulking delivered. Preparing work plan request for PWD shops to begin work in Tank Gallery
- Damaged low point drain repair
  - A FERNCO cap will be installed over the current plug and fitting. Parts are on order
- Corroded pipe hanger replacement
  - PWD shops work order initiated
- Provide protection to low point drains
  - Recommending administrative controls. It will be more effective than making the target area larger with a cage (which will only transfer forces to the main pipe)
- Repair “belly pump” to evacuate at Adit 3
  - PWD shops initiating purchase order for replacement pump. Waiting for quote with expedited delivery options.
- Test and maintain AFFF sump pumps
  - Working PWD EV to drain fuel risers in advance of Kinetix testing and maintenance of pumps.



[REDACTED]

# (U) Sketch 1 (DCBL)

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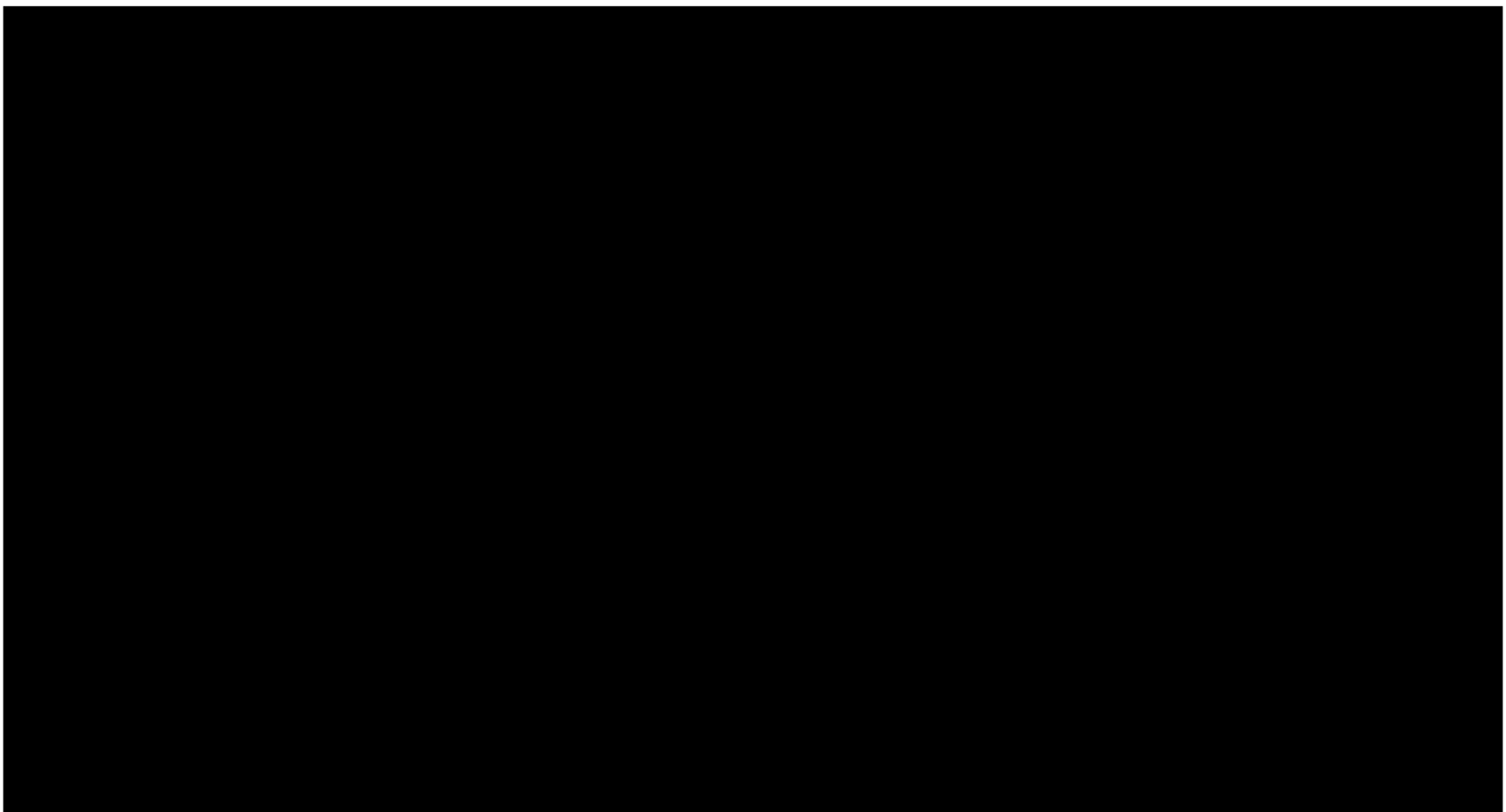




[REDACTED]

# (U) Schematic

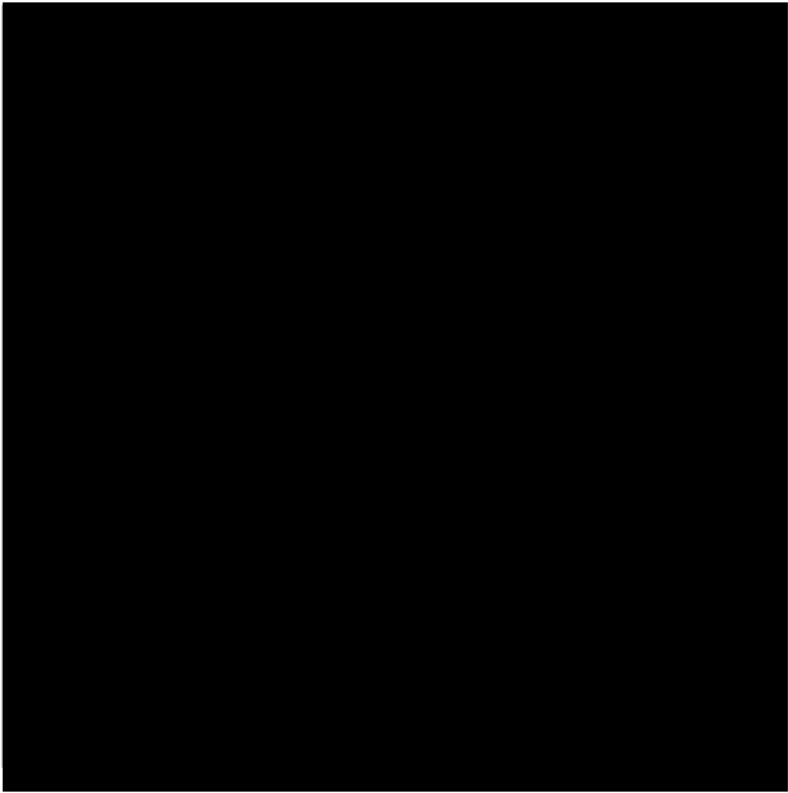
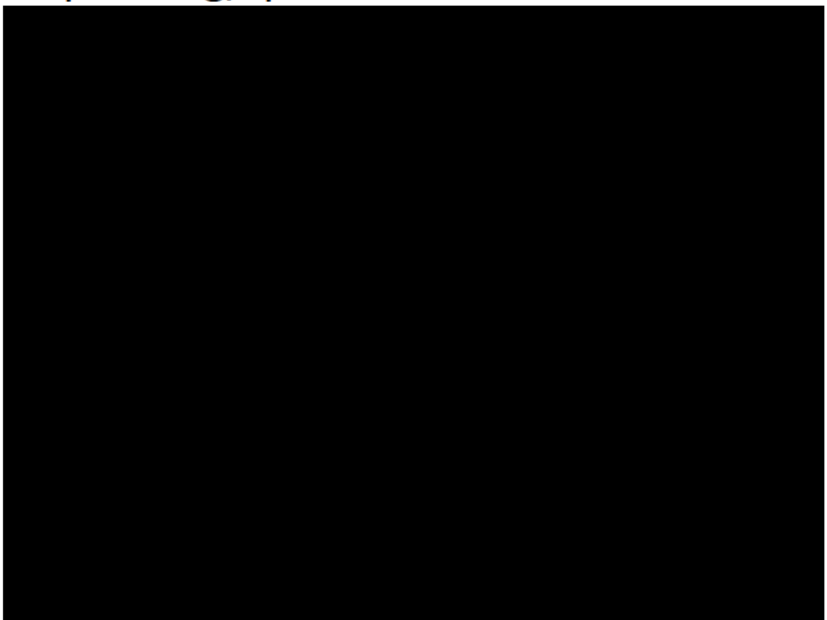
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## (U) Sketch 1 (comments)

- Need Pipe support details
- Maybe more fittings to preserve tunnel clearance
- Use steel. Reduce to [redacted]?
- Cut a 'hatch' into F-76 above midline. Open for venting.
- Additional vent(s) to minimize potential splashing/spills?



- Minor spill mitigations – absorbent pads and ground catchment at 'hatch'