**PERFORMANCE TESTING**

04/18

1. **Assumptions**
   1. Fueling system construction is substantially completed and fueling system is ready for operational testing: Equipment tests have been successfully completed.
      * Truck offloads
      * Pumphouse
      * Tanks
      * Hydrant Hose Truck (HHT) checkout station
      * Hydrant pits
      * Truck fill stands
      * Etc
   2. Government Furnished Equipment to test and max out the 2400 gpm system
      * Five R-11s (400 gpm fill rate - conservative assumption)
      * Five R-12s (HHTs) (600 gpm transfer rate – conservative assumption)
      * Different combinations to max out the system can be assembled, one possible configuration consists of:
        + R12 at HHT Checkout Stand (600 gpm)
        + R11 at Truck Fill Stand (400 gpm)
        + R11&R12 at Hydrant Pit (400 gpm)
        + R11&R12 at Hydrant Pit (400 gpm)
        + R11&R12 at Hydrant Pit (400 gpm)
        + R11&R12 at Hydrant Pit (400 gpm)
   3. Aircraft available for refueling on the last day. The installation has their own set of steps of inspection and certification before this will be permitted - sampling of the fuel being one of them. The Government may not provide aircraft for refueling efforts.
   4. Return to Bulk (RTB) will not occur during fueling testing if the RTB may affect the testing results. For example, RTB at the HHT Checkout Stand would affect testing on the hydrant loop. RTB into a truck offload position isolated from the loop would not affect testing on the hydrant loop.
   5. All hydrant pits must be tested using an R11&R12 or similar configuration.
   6. Let System Stabilize – means to wait about 15 seconds after pump start when return flow through the return venturi becomes stable.
   7. Defuel tests could be done at strategic times during Performance Testing to assist with RTB efforts.
   8. Lead pump must be changed between each test or as directed by Government Witness.
   9. All tests are led by a designated person, typically the System Supplier. When to start, perform duties, and when the test is over is coordinated through the dedicated person to assure safety and good consistent results.
   10. Testing involving fuel movement must be done only during daylight hours. Control Room computer tests involving no fuel movement may be conducted during non-daylight hours.
   11. There must be a meeting each morning prior to the daily Performance Testing efforts to review previous day’s tests, results, and plan for the day.
   12. All personnel and visitors involved in Performance Testing must sign in at the Control Room.
2. **Computer Tests**
   1. All Computer Tests must be completed before proceeding to Safety Tests
   2. Computer Tests, see Equipment Tests, Computer Tests.
3. **Safety Tests**
   1. Test all emergency stops, see Equipment Tests (Emergency Shutdown). All emergency stops must be tested before proceeding to fuel movement involving trucks or pantographs.
   2. Test all equipment for red critical alarm shut down, see Equipment Tests (Emergency Shutdown)
   3. Emergency Eye Wash and Shower, see Equipment Tests (Emergency Eye Wash and Shower)
   4. Ensure MCC and pump motor local switches are keyed properly.
      * Ex: Key FP-1 only fits FP-1 MCC & local, Key FP-2 only fits FP-2 MCC and local, etc.
   5. Tank 1, see Equipment Tests (Operating Tanks)
   6. Tank 2, see Equipment Tests (Operating Tanks)
   7. Fire Alarm, see Equipment Tests (Fire Alarm)
   8. PRT, see Equipment Tests (Product Recovery Tank)
   9. Four valve manifold/tank, see Equipment Tests (4 Valve Manifold)
   10. Tightness Monitoring System, see Equipment Tests (Tightness Monitoring System)
   11. Verify alarms are occurring at the RCC
4. **Jockey Pump Re-Pressurization**
   1. Start jockey pump by cracking a drain valve
   2. Verify pump stop when system pressurization has been returned
5. **Jockey Pump with Fuel Pump Start**
   1. Start jockey pump by opening a drain valve
   2. Verify jockey pump stop when lead pump is energized
6. **Fueling Pump Operation**
   1. Verify fueling pump operation, see Equipment Tests (Fueling Pump Operation – Automatic Mode).
   2. One method of verifying operation is to manually control the fuel return flow through the defuel/flush valve.
7. **Flush with EPDS**
   1. System in “flush”
   2. Start a single pump, manually
   3. Let system stabilize
   4. Push EPDS
   5. Verify pump stops, indicator light illuminates and red critical alarm
   6. Reset system
8. Lead pump must be changed on each subsequent test.
9. **HHT (Single Hose)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2R-12 at HHT Checkout Station

* 1. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  2. System in “automatic”
  3. Squeeze deadman
  4. Let system stabilize (single pump running)
  5. Release deadman
  6. Let system automatically shutdown
  7. Verify “typical” system operation
  8. Verify pressures, flows, time, etc in Equipment Test (Hydrant/Truck Fill/HHT Control Valves)

1. **HHT (Single Hose) with EPDS**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  3. System in “automatic”
  4. Squeeze deadman
  5. Let system stabilize (single pump running)
  6. Push EPDS
  7. Verify pump stops, indicator light illuminates and red critical alarm
  8. Reset system

1. **HHT (Single Hose) with Lead Pump Failure (Flow)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Close lead pump downstream isolation valve
  2. R-12 at HHT Checkout Station
  3. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  4. System in “automatic”
  5. Squeeze deadman
  6. Verify lead pump failure (white) alarm
  7. Verify lag pump start
  8. Let system stabilize (single pump running)
  9. Release deadman
  10. Let system automatically shut down

1. **HHT (Single Hose) with Lag Pump Failure (Flow)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Close lag pump downstream isolation valve
  2. R-12 at HHT Checkout Station
  3. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  4. System in “automatic”
  5. Squeeze deadman
  6. Verify lead pump start \*\*\*\*NO LACK OF RETURN FLOW TO CALL ON LAG PUMP\*\*\*\*
  7. Verify lag pump failure (white) alarm
  8. Verify follow on pump start
  9. Let system stabilize (single pump running)
  10. Release deadman
  11. Let system automatically shut down

1. **HHT (Single Hose) with PLC1 Failure and Sys1 Input Failure**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Fail PLC1 (Power down)
  2. Fail Sys1 PIT1 input (Disconnect in PCP)
  3. R-12 at HHT Checkout Station
  4. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Release deadman
  9. Let system automatically shut down
  10. Verify “typical” system operation by seamless takeover of PLC2
  11. Provide Power to PLC1

1. **HHT (Single Hose) with PLC2 Failure and Sys1 Input Failure**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Fail PLC2 (Power down)
  2. Fail Sys1 PIT1 input (Disconnect in PCP)
  3. R-12 at HHT Checkout Station
  4. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Release deadman
  9. Let system automatically shut down
  10. Verify “typical” system operation by PLC1 remaining in control and using Sys2 input
  11. Provide Power to PLC2
  12. Reconnect Sys1 PIT1 input

1. **HHT (Single Hose) with Full Plane Simulation**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  3. System in “automatic”
  4. Squeeze deadman
  5. Let system stabilize (single pump running)
  6. Slowly close (using 3 count) SPR isolation valve (simulating full plane tank)
  7. Verify surge pressure
  8. Release deadman (non-player at this point)
  9. Let system automatically shut down

1. **HHT (Dual Hose) Manual Step Up/Down**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect both hoses to ground level SPRs
  3. Close one hose
  4. System in “automatic”
  5. Squeeze deadman
  6. Let system stabilize (single pump running)
  7. Open second hose
  8. Let system stabilize (two pumps running)
  9. Slowly close one hose using a 3 second count (simulating one full plane tank)
  10. Let system stabilize (single pump running)
  11. Release deadman
  12. Let system automatically shutdown

1. **HHT (Dual Hose) Manual Step Up/Down with Lag Pump Failure (Power)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Fail lag pump by turning off at disconnect
  2. R-12 at HHT Checkout Station
  3. Connect both hoses to ground level SPRs
  4. Close one hose
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Open second hose
  9. Let system stabilize (two pumps running)
  10. Verify lag pump did not start, alarm sounded, and follow on pump started)
  11. Slowly close one hose using a 3 second count (simulating one full plane tank)
  12. Let system stabilize (single pump running)
  13. Release deadman
  14. Let system automatically shutdown

1. **HHT (Dual Hose)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect both hoses to ground level SPRs
  3. System in “automatic”
  4. Squeeze deadman
  5. Let system stabilize (two pumps running)
  6. Release deadman
  7. Let system automatically shutdown
  8. Verify “typical” system operation

1. **HHT (Single Hose) Underwing**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect single hose to overhead SPR (adjust to < 600gpm, single pump)
  3. System in “automatic”
  4. Squeeze deadman
  5. Let system stabilize (single pump running)
  6. Release deadman
  7. Let system automatically shutdown
  8. Verify “typical” system operation

1. **HHT (Dual Hose) Underwing**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
  2. Connect both hoses to overhead SPRs
  3. System in “automatic”
  4. Squeeze deadman
  5. Let system stabilize (two pumps running)
  6. Release deadman
  7. Let system automatically shutdown
  8. Verify “typical” system operation

1. **Truck Offload Tests**
   1. See Equipment Tests (Truck Offload Skid)
2. **Emergency Generator and HHT (Single Hose)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Transfer power to emergency generator
  2. Verify Kirk key (trapped key) operation
  3. R-12 at HHT Checkout Station
  4. Connect single hose to ground level SPR (adjust to < 600gpm, single pump)
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Release deadman
  9. Let system automatically shutdown
  10. Verify proper generator operation

1. **Emergency Generator and HHT (Dual Hose)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Transfer power to emergency generator
  2. R-12 at HHT Checkout Station
  3. Connect both hoses to ground level SPRs
  4. System in “automatic”
  5. Squeeze deadman
  6. Let system stabilize (two pumps running)
  7. Release deadman
  8. Let system automatically shutdown
  9. Verify “typical” system operation

1. **Truck Fill Stand**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Verify each truck fill stand
  2. R-11 at truck fill stand
  3. Connect truck fill stand hose to R-11
  4. Connect Scully ground proving system
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Slowly close (using 3 count) R-11 bottom loading valve (simulating full plane tank)
  9. Verify surge pressure
  10. Open R-11 bottom loading valve
  11. Let system stabilize
  12. Disconnect Scully
  13. Verify truck fill stand control valve closure
  14. Reconnect Scully
  15. Let system stabilize
  16. Release deadman
  17. Let system automatically shutdown
  18. Verify “typical” system operation
  19. Verify pressures, flows (525 gpm), time, etc in Equipment Test (Hydrant/Truck Fill/HHT Control Valves)

1. **Apron Hydrant Pit with One Truck**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. Verify each hydrant pit
  2. R-12 at hydrant pit connected to R-11
  3. Connect R-12 hose to hydrant pit
  4. Connect R-12 issue hose to R-11
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Slowly close (using 3 count) R-11 bottom loading valve (simulating full plane tank)
  9. Verify surge pressure
  10. Open R-11 bottom loading valve
  11. Let system stabilize
  12. Release deadman
  13. Let system automatically shutdown
  14. Verify “typical” system operation
  15. Verify pressures, flows (~400 gpm), time, etc in Equipment Test (Hydrant/Truck Fill/HHT Control Valves)

1. **Apron Hydrant Pit with Two Trucks**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to two R-11s
  2. Connect R-12 and hose to hydrant pit
  3. Connect R-12 issue hose to R-11 (truck bottom loading valve open)
  4. Connect second R-12 issue hose to R-11 (truck bottom loading valve closed)
  5. System in “automatic”
  6. Squeeze deadman
  7. Let system stabilize (single pump running)
  8. Verify pressures and flow rates
  9. Open second truck bottom loading valve
  10. Let system stabilize (two pumps running)
  11. Verify pressures and flow rates
  12. Close first R-11 bottom loading valve using a 3 second count
  13. Release deadman
  14. Let system automatically shutdown

1. **Apron Hydrant Pit (Two) with One Truck Each**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit X connected to R-11
  2. R-12 at hydrant pit Y connected to R-11
  3. Connect R-12 hose to hydrant pit
  4. Connect R-12 issue hose to R-11
  5. System in “automatic”
  6. Squeeze deadman at hydrant pit X
  7. Let system stabilize (single pump running)
  8. Verify flow rates and pressures
  9. Squeeze deadman at hydrant pit Y
  10. Let system stabilize (two pumps running)
  11. Verify flow rates and pressures
  12. Release deadman at hydrant pit X
  13. Verify surge pressure
  14. Release deadman at hydrant pit Y
  15. Verify surge pressure
  16. Let system automatically shutdown

1. **Apron Hydrant Pit (Two) with One Truck Each Simultaneous Start/Stop**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit X connected to R-11
  2. R-12 at hydrant pit Y connected to R-11
  3. Connect R-12 hose to hydrant pit
  4. Connect R-12 issue hose to R-11
  5. System in “automatic”
  6. Squeeze both deadman at the same time
  7. Let system stabilize (single pump running)
  8. Verify flow rates and pressures
  9. Release both deadman at the same time
  10. Verify surge pressure
  11. Let system automatically shutdown

1. **Apron Hydrant Pit (Two) with One Truck Each – Simultaneous Start/Stop**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit X connected to R-11
  2. R-12 at hydrant pit Y connected to R-11
  3. Connect R-12 hose to hydrant pit
  4. Connect R-12 issue hose to R-11
  5. System in “automatic”
  6. Squeeze deadman at hydrant pit X & Y simultaneously
  7. Let system stabilize (two pumps running)
  8. Verify flow rates and pressures
  9. Release deadman at hydrant pit X & Y simultaneously
  10. Verify surge pressure
  11. Let system automatically shutdown

1. **Apron Hydrant Pit and Truck Fill Stand**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to R-11
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to R-11
  2. R-11 at truck fill stand
     + Connect truck fill stand hose to R-11
  3. System in “automatic”
  4. Squeeze deadman at Hydrant Pit
     + Let system stabilize (single pump running)
     + Verify flows and pressures
     + Let system stabilize
  5. Squeeze deadman at Truck Fill Stand
     + Let system stabilize (two pumps running)
     + Verify flows and pressures
  6. Release deadman at Hydrant Pit
     + Verify surge pressure and stop of second pump
  7. Release deadman at Truck Fill Stand
     + Verify surge pressure
  8. Let system automatically shutdown

1. **Apron Hydrant Pit and Two Truck Fill Stands**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to R-11
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to R-11
  2. R-11 at each truck fill stand (2)
     + Connect truck fill stand hose to R-11
  3. System in “automatic”
  4. Squeeze deadman at Hydrant Pit
     + Let system stabilize (single pump running)
     + Verify flows and pressures
     + Let system stabilize
  5. Squeeze deadman at first Truck Fill Stand
     + Let system stabilize (two pumps running)
     + Verify flows and pressures
  6. Squeeze deadman at second Truck Fill Stand
     + Let system stabilize (two pumps running)
     + Verify flows and pressures
  7. Release deadman at Hydrant Pit
     + Verify surge pressure and stop of second pump
  8. Release deadman at first Truck Fill Stand
     + Verify surge pressure
  9. Release deadman at second Truck Fill Stand
     + Verify surge pressure
  10. Let system automatically shutdown

1. **Three Apron Hydrant Pits and Two Truck Fill Stands – Max Flow**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at each hydrant pit (3) connected to R-11
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to R-11
  2. R-11 at each truck fill stand (2)
     + Connect truck fill stand hose to R-11
  3. System in “automatic”
  4. Squeeze deadman at Hydrant Pit X
     + Let system stabilize (single pump running)
     + Verify flows and pressures
     + Let system stabilize
  5. Squeeze deadman at Hydrant Pit Y
     + Let system stabilize (two pumps running)
     + Verify flows and pressures
     + Let system stabilize
  6. Squeeze deadman at Hydrant Pit Z
     + Let system stabilize (three pumps running)
     + Verify flows and pressures
     + Let system stabilize
  7. Squeeze deadman at first Truck Fill Stand
     + Let system stabilize (three pumps running)
     + Verify flows and pressures
  8. Squeeze deadman at second Truck Fill Stand
     + Let system stabilize (four pumps running)
     + Verify flows and pressures
  9. Release deadman at Hydrant Pit X
     + Verify surge pressure and stop of second pump
  10. Release deadman at Hydrant Pit Y
      + Verify surge pressure and stop of second pump
  11. Release deadman at Hydrant Pit Z
      + Verify surge pressure and stop of second pump
  12. Release deadman at first Truck Fill Stand
      + Verify surge pressure
  13. Release deadman at second Truck Fill Stand
      + Verify surge pressure
  14. Let system automatically shutdown

1. **HHT (Dual Hose) and Truck Fill Stand Simultaneous Start**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at HHT Checkout Station
     + Connect both hoses to ground level SPRs
  2. R-11 at truck fill stand
     + Connect truck fill stand hose to R-11
  3. System in “automatic”
  4. Squeeze both deadman simultaneously
  5. Let system stabilize (three pumps running)
  6. Release deadman at truck fill stand
  7. Let system stabilize
  8. Release deadman at R-11
  9. Let system automatically shutdown
  10. Verify “typical” system operation

1. **Flushing**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

PLC: 1 2 Sys: 1 2

* 1. System in “flush”
  2. Manually start FP-1 thru 5 at pushbuttons next to pumps
  3. Verify pressures and tank levels recorded in Equipment Tests (Flushing)
  4. Manually stop FP-1 thru 5

1. **Defuel – Automatic Mode**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to R-11
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to R-11
  2. System in “automatic”
  3. Energize R-12 to defuel from the R-11
  4. Verify pressures and flow rates from the Equipment Tests (Defueling Performance)

1. **Defuel – Defuel Mode**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to R-11
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to R-11
  2. System in “flush” (defuel)
  3. Energize R-12 to defuel from the R-11
  4. Verify pressures and flow rates from the Equipment Tests (Defueling Performance)

1. **Filter Separator Water Slug**
   1. System in “flush”
   2. Return flow routed through receipt filter separators
   3. Manually start FP-1
   4. Manually trigger each float to verify control valve closure
   5. Verify Equipment Tests (Filter Separator Float Control Valve Manual Test)
2. **Generator – Max Capacity and HHT (Dual Hose)**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

* 1. Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2Power switched to generator
  2. R-12 at HHT Checkout Station
  3. Connect both hoses to ground level SPRs
  4. System in “automatic”
  5. Squeeze deadman
  6. Let system stabilize (two pumps running)
  7. Release deadman
  8. Let system automatically shutdown
  9. Verify “typical” system operation

1. **Aircraft Refuel**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

Lead Pump:\_\_\_ PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to aircraft
  2. Connect R-12 hose to hydrant pit
  3. Connect R-12 issue hose (or two) to aircraft
  4. System in “automatic”
  5. Squeeze deadman
  6. Let system stabilize (single (or two) pump(s) running)
  7. Release deadman
  8. Verify proper operation

1. **Aircraft Defuel**

Date:\_\_\_\_\_ Start Time:\_\_\_\_\_ End Time:\_\_\_\_\_

PLC: 1 2 Sys: 1 2

* 1. R-12 at hydrant pit connected to aircraft
     + Connect R-12 hose to hydrant pit
     + Connect R-12 issue hose to aircraft
  2. System in “flush” (defuel) or “automatic”
  3. Energize R-12 to defuel the aircraft
  4. Verify proper operation and record pressures and flow rates

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DESIGNER NOTE: The number of tests listed here exceed the normal efforts associated with Performance Testing. Depending on the system size quantity of tests should be revised. Typical efforts last a week with the following schedule:

* Mon walk thru of the system in the afternoon when government witnesses arrive
* Tue Computer, Safety, and HHT tests completed
* Wed Apron tests
* Thu Aircraft tests and out briefing
* Fri travel

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