I. PURPOSE

This procedure establishes guidelines for the annual testing of all fire pumps in buildings within the University of Rochester by representatives of the University Fire Marshal’s Office. This procedure is based on NFPA 25 Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, Chapter Eight.

II. PERSONNEL AFFECTED

Fire Safety Specialist and Fire Safety Inspectors from the Office of Environmental Health and Safety, Fire Safety Unit.

III. DEFINITIONS

FSS  Fire Safety Specialist
FSI  Fire Safety Inspector

IV. RESPONSIBILITIES

A. The FSS or FSI is responsible for the annual flow testing of all fire pumps in buildings within their area of responsibility. Upon identification of any deficiencies it is the responsibility of the FSS to issue work orders and work with the appropriate personnel to see that repairs and or replacements are made to all deficient materials.

B. The landlord is responsible for the annual flow testing of all fire pumps in buildings not owned by the University. Upon identification of any deficiencies it is the responsibility of the landlord to correct all deficiencies.

V. PROCEDURES

A. The annual test shall be conducted under churn, 100% of pump rating, and 150% of pump rating of the fire pump by controlling the quantity of water discharged through approved test devices. If available suction supplies do not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be permitted to operate at maximum allowable discharge without having the suction pressure reduce to less than 20psi. Weekly inspection checklists should also be followed during the annual testing.

B. Use Hose Monsters to help disperse the water and increase safety.

C. Pump suction and discharge pressures and the flow measurements of each hose stream shall be determine the total pump output. Care shall be taken to prevent water damage by verifying there is adequate drainage for the water discharge from hoses.

D. The pertinent visual observations, measurements, adjustments and documentation specified in the following checklists shall be conducted while performing the fire pump test under the specified condition.

a. Pretest inspection/preparations
   (1) Check for A/C power at pump controller.
   (2) For diesel fire pumps, make sure fuel level is adequate and not below 3/4 full.
   (3) Change out current gauges on suction and discharge with liquid filled gauges.
(4) Verify alignment of all valves in sprinkler room are in correct positions.
(5) Make sure test header drain is closed.
(6) Record static pressure of suction and discharge with fire pump off.

b. No-flow condition (churn) test:
(1) Follow same procedure as the weekly fire pump test procedure. Make sure jockey pump is turned off.
(2) Check circulation relief valve for operation to discharge water.
(3) Check the pressure relief valve (if installed) for proper operation.
(4) Check for proper water displacement off fire pump packings.

c. 100% of rated flow test:
(1) Open test header main isolation valve.
(2) Manipulate the test header valves to the desired flow for 100% of fire pump rating.
(3) Have an electrician take readings at each phase line and record the electric motor voltage and current (all lines).
(4) Record the pump speed in rpm.
(5) Record the simultaneous (approximately) readings of pump suction pressure, discharge pressure and hose stream pitot readings.
(6) Monitor pump packaging temperature.

d. 150% of rated flow test:
(1) Manipulate the test header valves to the desired flow or as close as possible to achieve 150% of fire pump rating.
(2) Have an electrician take readings at each phase line and record the electric motor voltage and current (all lines).
(3) Record the pump speed in rpm.
(4) Record the simultaneous (approximately) readings of pump suction pressure, discharge pressure and hose stream pitot readings.
(5) Monitor pump packaging temperature.

e. Water supply test
(1) Shut down the fire pump at the controller.
(2) Open all test header valves to the full open position.
(3) Record pitot readings at each test header outlet.
(4) Record pump suction and discharger pressures.

f. Realignment
(1) After all readings have been completed close test header valves
(2) Close test header main isolation valve.
(3) Open test header drain line.
(4) Open test header valves to support draining of test header.
(5) Once test header is drained, close test header valves.
(6) Close test header drain line.
(7) Cap test header threads.
(8) Verify valve alignment of fire pump.
(9) Turn jockey pump on to bring system up to desired pressure.
(10) Once system up to desired pressure, turn main pump on.
(11) Verify alignment of power to fire pump.

All information obtained will be returned to the University Fire Marshal for further calculation and graphing of the fire pump test results.

VI. REFERENCES

VII. APPENDICES/FORMS
Fire Pump Test Sheet – Blank Form

VIII. REVISION HISTORY

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/27/2011</td>
<td>1</td>
<td>Added clarity to the procedure for pretesting and more specific steps for each test</td>
</tr>
<tr>
<td>6/21/2016</td>
<td>2</td>
<td>Updated procedure</td>
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Appendix I

### Annual Fire Pump Performance Test

<table>
<thead>
<tr>
<th>Date</th>
<th>Inspectors</th>
<th>Location</th>
<th>UR Fire Marshals Office</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building</td>
<td>Make</td>
<td>Capacity</td>
<td>GPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump Off Static</td>
<td>Pump On Static</td>
<td>Flow Test #1</td>
<td>Flow Test #2</td>
</tr>
<tr>
<td>Static</td>
<td>Static</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Number of test header ports used

#### Length of each hose line (50’ lines)

#### Hose diameter

#### Nozzle size

1 3/4”

#### Pump suction pressure

#### Pump discharge pressure

#### Net pump pressure

#### Hydrant pressure

#### Pilot pressure (taken from Hose Monster)

Using 1 3/4” insert

#### Flow meter reading

<table>
<thead>
<tr>
<th>Calculated GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
</tr>
<tr>
<td>L2</td>
</tr>
<tr>
<td>L3</td>
</tr>
<tr>
<td>L4</td>
</tr>
</tbody>
</table>

#### RPM:

<table>
<thead>
<tr>
<th>Fire pump kick ON pressure</th>
<th>PSI</th>
<th>Fire pump kick OFF pressure</th>
<th>PSI</th>
<th>Jockey pump kick ON pressure</th>
<th>PSI</th>
<th>Jockey pump kick OFF pressure</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timer operates properly</td>
<td>YES</td>
<td>Pump run timer shutoff</td>
<td></td>
<td></td>
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<tr>
<td>Overheating OK</td>
<td>YES</td>
<td>Vibration OK</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pressure drop start OK</td>
<td>YES</td>
<td>Automatic start OK</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Manual start OK</td>
<td>YES</td>
<td>Bearings OK</td>
<td></td>
<td></td>
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<tr>
<td>Transfer to emergency power during peak load OK</td>
<td>YES</td>
<td>NO</td>
<td></td>
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<tr>
<td>Transfer back to normal power during peak load OK</td>
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<td>NO</td>
<td></td>
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### Notes:

### Comments: