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VERTICAL IN-LINE AND FIREPAK ELECTRIC MOTOR DRIVEN FIRE PUMP PRE START-UP CHECKLIST (U.S. VERSION)

This pre start-up checklist shows items that must be completed prior to a scheduled start-up. If the answer to any questions is "No"(when it should be "Yes"), is left blank or contradicts the requirements of NFPA 20, the installation is not ready for start-up. Indicate "N/A" for not applicable wherever appropriate. These questions should be answered in conjunction with the fire pump (mechanical) contractor and electrical contractor. Check list must be returned signed and dated below.

Fire Pump IO&M manuals are available from Armstrong Darling's website www.armstrongpumps.com

The sole purpose of this pre start-up checklist is to serve as a guide only. Armstrong does not assume any liability or responsibility for the accuracy of this list or any items omitted. This list does not absolve the installing contractors of their responsibilities for proper installation in accordance with the local and national codes and standards.

Project Name: _____
 Site Address: _____, City: _____, State: _____
 Insuring Authority: _____
 Flow Test to be performed by: Company Name: _____
 Contact: _____ Tel: _____ Fax: _____
 Pre Start-Up Check Date: _____
 Pre Start-Up Checklist completed by: a). Company Name: _____
 b). Contact Name: _____
 c). Telephone: _____ Fax: _____

I. NAMEPLATE DATA (must be taken directly from each equipment nameplate):

1. Pump Model Number: _____ Pump S/N: _____
 2. Rated Flow: _____ Rated Pressure: _____ Pump Speed: _____ rpm
 3. Controller Mfg: _____ Model Number: _____
 4. Controller S/N: _____ Voltage: _____ Phase: _____ Hz: _____
 5. Motor Mfg: _____ Model Number: _____
 6. Motor S/N: _____ Horsepower: _____ Motor Speed: _____ rpm
 7. Voltage: _____ Phase: _____ Hz: _____
 8. Jockey Pump Model Number: _____ Jockey Pump S/N: _____
 9. Jockey Pump Motor Mfg: _____ Model Number: _____
 10. Jockey Pump Motor S/N: _____ Horsepower: _____ Motor Speed: _____ rpm
 11. Jockey Pump Motor Voltage: _____ Phase: _____ Hz: _____

II. GENERAL INSTALLATION:

	YES	NO
1. Visual Inspection done of the overall pump assembly (No visible sign of cracks, damage, rust or watermarks).	_____	_____
2. All mechanical installation in accordance with NFPA 20 Standards.	_____	_____
3. All electrical installation in accordance with NFPA 70 Standards.	_____	_____
4. All electrical supplies correspond to all motor and controller nameplates.	_____	_____
5. Entire pump assembly base securely anchored with foundation bolts of suitable size embedded in the concrete floor.	_____	_____
6. Entire pump assembly base grouted sufficiently substantial to absorb any vibration and to form a rigid support for the base plate.	_____	_____
7. Entire pump assembly base level and aligned with all connecting piping and fixtures.	_____	_____
8. Fire Pump System manual c/w certified performance curve and wiring diagrams available for start-up.	_____	_____
9. Entire system has been bled of all air.	_____	_____

III. MAIN FIRE PUMP INSTALLATION – ELECTRIC DRIVEN (HSC & ES):

1. Pump installed in the proper direction of flow in relation to the system (Suction & Discharge Orientation).	_____	_____
2. Drive to Pump direction of rotation correct. (verified in conjunction with an electrician).	_____	_____
3. Pump rotates freely when turned by hand.	_____	_____
4. Minimum of 4 to 6 pipe diameters length of straight pipe installed at pump suction connection.	_____	_____
5. Suction and Discharge system piping supports c/w anchors installed near to but independent of the pump assembly.	_____	_____

- 6. System piping does not exert any strain on the pump casing. _____
- 7. Eccentric reducer installed on the pump suction side (as required by NFPA 20). _____
- 8. Concentric Increaser installed on the pump discharge side (as required by NFPA 20). _____
- 9. Suction line has been tested to ensure there aren't any leaks. _____
- 10. Listed OS&Y Gate Valve installed close to pump on the suction sided of the pump. _____
- 11. Listed OS&Y Gate Valve or Butterfly Valve on pump discharge line. _____
- 12. A Listed Check Valve is installed and is in the proper direction. _____

IV. JOCKEY PUMP INSTALLATION:

- 1. Jockey pump inlet and outlet are in the proper location. _____
- 2. Jockey pump direction of rotation is correct. _____
- 3. Jockey pump suction line is piped ahead of the main fire pump suction OS&Y Gate Valve. _____
- 4. Jockey pump discharge line is piped after the main fire pump discharge valve (OS&Y or Butterfly). _____
- 5. Jockey Line contains 2 isolation gate valves and a check valve. _____

V. PUMP MINIMUM FITINGS:

- 1. A 3/4" Circulation (Casing) Relief Valve (CRV) is installed at the casing discharge (before the check valve). _____
- 2. CRV pressure set. _____
- 3. CRV and Pump stuffing box piped to drain. _____
- 4. Compound Suction gauge with 3 1/2" dial face with pressure range twice the maximum suction pressure but not less than 100 psi with 1/4" gauge valve (as per NFPA 20 2-5.2). _____
- 5. Discharge gauge with 3 1/2" dial face with pressure range twice the rated working pump pressure but not less than 200 psi with 1/4" gauge valve (NFPA 20 2-5.1). _____

VI. SENSING LINES FOR MAIN FIRE PUMP & JOCKEY PUMP:

- 1. Main fire pump and Jockey pump sensing lines totally independent of each other and connected to their respective controllers in accordance with NFPA 20 Figure A-7-5.2.1 (a) & (b). _____
- 2. Each sensing line 1/2" non-ferrous metallic piping [as per NFPA 20 7-5.2.1 (b)]. _____
- 3. Each sensing line has 2 bronze check valves each with a 3/32" diameter hole drilled in the flapper. _____
- 4. All sensing line check valves are orientated to open in the direction of the pump. _____
- 5. Check valves spaced 5 feet from each other. _____

VII. FIRE PUMP AND JOCKEY PUMP CONTROLLERS:

- 1. Fire Pump Controller is located within sight of the motor (as per NFPA 20 7-2.1). _____
- 2. Fire Pump Controller installed not less than 12 inches above the floor (as per NFPA 20 7-2.2). _____
- 3. The appropriate incoming power service is connected and installed as per NFPA 20 and 70. _____
- 4. Motor terminations complete. _____
- 5. Proper materials used (including Liquid-tite conduit, etc.). _____
- 6. Listed termination kits used. _____
- 7. Motor rotation verified and correct. _____
- 8. Fuses available and installed prior to start-up date (Jockey Pump Panel). _____
- 9. Separate manual and wiring diagram inside each controller enclosure. _____
- 10. Listed Pressure Recording Device installed (NFPA 20 7-5.2.1(e)) _____

VIII. AUTOMATIC POWER TRANSFER SWITCH (if applicable):

- 1. Listed Automatic Power Transfer Switch installed as per NFPA 20. _____
- 2. Emergency power generator installed and start-up completed. _____
- 3. Proper size circuit breakers installed. _____
- 4. Emergency power conductors wired and engine start circuits installed from the generator to the fire pump power transfer switch. _____

IX. MAIN RELIEF VALVE (if applicable):

- 1. Listed Main Relief Valve installed. _____
- 2. Located between the pump discharge and the check valve. _____
- 3. Confirm: Maximum Suction Pressure _____, Pump Shut-Off Pressure _____
System Rated Pressure _____

X. ENCLOSED DISCHARGE CONE (if applicable):

- 1. Enclosed discharge cone installed on the outlet line of the main relief valve. _____
- 2. Provides for a visual indication of water movement or has a sight glass. _____
- 3. Piped to the drain, or discharges back to the main fire pump suction line. _____

XI. FLOW METER (if applicable):

- 1. Listed for fire pump service and installed in proper direction. _____
- 2. Flow meter gauge display has a range of at least 1.75 times the rated flow of the fire pump. _____
- 3. Capable of being isolated and removed without affecting fire pump service. _____
- 4. Straight pipe length before and after flow meter in accordance with manufacturers specifications. _____

XII. BY-PASS LINE (if applicable):

- 1. Pump by-pass line installed across the main fire pump. _____
- 2. Complete with listed check valve and isolation valves. _____

XIII. TEST FITTINGS (if applicable):

- 1. Test tee installed after the check valve and before the discharge butterfly valve. _____
- 2. Hose valve header sized and contains the right number of hose valve outlets according to NFPA 20 Table 2-20 _____
- 3. Ball drip valve installed prior to the hose valve header (NFPA 20 2-14.3.3). _____
- 4. Indicating gate valve or Indicating butterfly valve installed between Test-Tee and Hose Valve Header. _____

XIV. LOW SUCTION PRESSURE SHUT-OFF PANEL (if applicable):

- 1. Low Suction Pressure Shut-Off panel installed. _____
- 2. Sensing line and electrical connections installed in accordance with manufacturer's instructions. _____

XV. ADDITIONAL COMMENTS:

Signed: _____ Date: _____

I certify the above items are completed and were checked at the job site and the pump equipment is ready for a start-up and performance test.

Once fully completed, please return the above Pre Start-Up Check List to _____ (local U.S. Armstrong Darling Representative) to the attention of _____ . Please note, all fire pump start-up requests may require a minimum of 2-3 weeks advanced notice in order to schedule a date with the appropriate parties (equipment representatives & their technicians). The actual scheduled start-up date(s) will be determined based on the availability of these parties. It is the responsibility of the installing contractor to arrange for the other required parties to be present and have the installation ready on the scheduled date for the subject start-up. Scheduling of fire pump start-up will commence only once the installation is deemed ready for start-up as derived from the answers provided on this form.

Important: A standard start-up is based on a maximum 3 hours at the job site. Should the time required to complete the start-up exceed this standard duration or should the start-up service need to be repeated due to circumstances caused by other parties, and or situations out of our control, any additional service or incurred costs are the sole responsibility of the installing contractor.

Before performing any tests, to avoid false alarms where a supervisory service is provided, the alarm receiving facilities must always be notified by the building owner or designated representative.

Prior to the Start-Up, the Installing Contractor must ensure that the Pre-Start-Up Verification has been performed and provide confirmation to the local U.S. Armstrong Darling representative ensuring:

- 1. Pump Alignment.
- 2. Pump Packing Gland Adjusted.
- 3. System Integrity.
- 4. Electrical Integrity.
- 5. All applicable items on the Pre Start-Up Checklist have been verified and answered accordingly.
- 6. The installation is ready for start-up (including all air bled from the system and ready to flow water) and is in accordance with all applicable national and local codes and standards.
- 7. All applicable documentation is on-hand at start-up (including pump certified performance curve(s), equipment manuals & wiring diagrams).
- 8. All the appropriate parties (e.g. AHJ-Fire Marshall, Electrician, Millwright/Pipe Fitter, Building Owner/Representative, etc.) will be present throughout the entire start-up.

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