

## AS 2941-2013 Electric Fire Pumpset Check List

Please answer YES or No as appropriate. (if the answer is "NOT SURE" then answer "NO!")

| Clause   | ITEMS TO CHECK   | INSPECTION REPORT  | Complies  |
|----------|--|--|---|
|          | <p><b>Electric Motor Driven Fire Pumpset Detail</b></p> <p>Duty Flow - LPM <input type="text"/> Duty Pressure - kPa <input type="text"/> Quantity <input type="text"/></p> <p>2.5.1 NPSHR @ 130% Flow - m <input type="text"/> NPSHA @ 130% Flow - m <input type="text"/> Serial No. <input type="text"/></p> <p>3.1 Shut-off Pressure measured at site (less suction pressure) - kPa <input type="text"/> Driver KW <input type="text"/></p> <p>8.1.3 Pump Power Rqd @ 130% Flow - kW <input type="text"/> Pump power with 115% Margin <input type="text"/></p> | <p>Is Manufacturer's Curve Attached? <input type="text"/></p> <p>Is NPSHA greater than NPSHR+1 @ 130% Flow? <input type="text"/></p> <p>Is shut-off pressure &lt; 140% of duty pressure? <input type="text"/></p> <p>Is Driver kW greater than Pump Power with 115% margin? <input type="text"/></p> | <p>YES/NO</p> <p>YES/NO</p> <p>YES/NO</p> <p>YES/NO</p> |
| 2.4      | <p>Flooded Suction to pump intake port. (AS2419 &amp; AS2941 systems NO suction lift)<br/>(AS2118.2006 Cl 4.3.9.2 requires 2/3 tank effective capacity to be above pump suction centreline.)</p> <p>Total Height Eff. Water capacity - m <input type="text"/></p>  | <p>Tank high water level to Centre line of Pump Suction Port - m <input type="text"/></p> <p>Is 2/3 effective capacity above pump suction centreline? <input type="text"/></p> <p>Is the Suction gauge reading above 0 kPa? <input type="text"/></p>   | <p>YES/NO</p> <p>YES/NO</p>                             |
| 2.5.2    | Check No Prohibited devices (e.g. - Check, Butterfly or Globe Valves & Flow Switches) on Pump suction Manifold   | Suction No prohibitive devices? Isolation valve OS&Y type? If Butterfly located 15 pipe dia.   | YES/NO  |
| 3.7.2    | If strainer fitted check - Free area > 4 times pump suction entry area & Individual strainer opening < 8mm x 8mm   | Is strainer, if fitted, sized correctly?   | YES/NO  |
| 3.6.1    | Check Pump & System Component pressure rating is greater than Pump Shut-off pressure + Suction pressure.   | Maximum Working Pressure = Pump Shut-off + Maximum Suction pressure <input type="text"/>   |   |
| 3.6.2    | Check Suction & Discharge Pipe work sized for < 4m/s velocity at Maximum flow  | Is Maximum Working pressure less than Pump Casing or System Component pressure ratings? <input type="text"/>   | YES/NO  |
| 3.6.2    | Pump Casing Press. Rating <input type="text"/> System Component Pressure Rating <input type="text"/>   |  |   |
| 3.6.2    | Check Suction & Discharge Pipe work sized for < 4m/s velocity at Maximum flow  | Velocity m/s <input type="text"/> Is this less than 4m/s?  | YES/NO  |
| 3.6.2    | Max flow = Duty Flow x1.3 - LPM <input type="text"/> Suct/Disch Pipe & Valve Dia mm <input type="text"/>   |  |   |
| 3.6.7    | Check pipe Flexible connections if fitted are metallic Braided type  | Is pipe flexible connections fitted? Are they metallic type?   | YES/NO  |
| 3.6.8    | Check no pipe loads acting on pump casing  | Are there pipe supports either side of pump flanges?   | YES/NO  |
| 3.7.3    | Check automatic air release valve fitted for horizontal split case & vertical turbine type pump sets   | Is air release valve fitted (Not a screwed type plug)?   | YES/NO  |
| 3.7.4.1  | Check Circulation Relief valve (CRV) fitted & sized as below   | Pump Duty Flow - lps <input type="text"/> Is CRV size & pressure set point correct? <input type="text"/>   | YES/NO  |
|          | Size = 19mm for pump flows to 9,500 LPM  | CRV Size - mm <input type="text"/>   |   |
|          | Size = 25mm for pump flows 9,501 to 19,000 LPM   |  |   |
|          | Higher Flow/Pressure Pumps & Vertical Turbine type Pumps - valve size recommended by manufacturer  | CRV recommended size - mm <input type="text"/> Attach manufacturer's recommendation? <input type="text"/>  | YES/NO  |
| 3.7.4.3  | CRV Pressure Set point = < Shut-off + Min Suction Pressures  | CRV Pressure Set point - KPa <input type="text"/>  |   |
| 3.7.5.1  | Pressure Relief Valve (PRV) if required per Table 3.1 shall be sized as per Figure 3.6   | Is PRV required per Table 3.1? Is PRV Sizing Chart (Fig 3.6) provided?   | YES/NO  |
| 3.7.5.5  | Multiple PRV installations shall not be manifolded.  | Does PRV's have separate discharge points?   | YES/NO  |
| 3.8      | Check CRV & PRV discharge is visible at pump set   | Is Discharge from CRV and PRV Visible to operator when at pumpset?   | YES/NO  |
| 3.9.2    | Discharge Pressure gauge 100mm Dial face, kPa units, Scale 1000 kPa or minimum twice Duty pressure   | Is suction gauge Face Dia & Scale sized correctly?   | YES/NO  |
|          | Discharge gauge Located min 2 Dia straight pipe from pump flange & 1 Dia downstream of gauge point.  | Is suction Gauge located on straight pipe piece of length 2D upstream & 1D downstream?   | YES/NO  |
| 3.9.3    | Suction Pressure gauge 100mm Dial face, kPa units, Compound ± vee scale suit incoming pressure.  | Is discharge gauge Face Dia & Scale sized correctly?   | YES/NO  |
|          | Suction gauge Located min 2 Dia. straight pipe upstream & downstream of gauge point  | Is discharge Gauge located on straight pipe piece of length 2D upstream & 2D downstream?   | YES/NO  |
| 3.10.1   | Flow measuring means provided & separate for each pump.  | Is Flow measuring means installed to Fig 3.11?   | YES/NO  |
| 3.10.2   | Flow Measuring capacity 110% of Maximum flow   | Is Flow measure capacity ≥ 1.1x1.3xDuty Flow?  | YES/NO  |
| 3.10.3   | Flow device does not discharge into pump suction pipe work.  | Is Outlet connected to Drain or Tank?  | YES/NO  |
| 3.11.2   | Fire Pump Automatic start via single or duplicate Pressure sensors. No of sensors fitted <input type="text"/>  | No. of pressure sensors required <input type="text"/>  |   |
|          | Note All fire systems will require single sensor except multiple sprinkler systems.  | Does number of pressure sensors fitted equal required?   | YES/NO  |
| 4.1.8(a) | Verify Pump Bearings rated > 5,000hrs @ Minimum Continuous Flow (MCF) or Maximum load.   | Request manufacturer's computation & verify calculation done for minimum continuous flow   | YES/NO  |
| 4.2.1-4  | End Suction Pump is to International Standard, Back Pull out Spacer coupled & 1600KPa Working Pressure rated.  | End suction pump complies?   | YES/NO  |
| 4.3.1    | Axially Split Case Pump fitted with renewable casing Ring and Plugged Tapping for Air Release & Drain  | Axially Split Case pump complies?  | YES/NO  |
| 4.4.2    | Multi-stage Multi-outlet Pumps - Threaded hole in each individual casing section for air release   | Multistage pump complies?  | YES/NO  |
| 4.5.10   | Vertical Turbine Pump - Automatic Air Release Valve fitted - Size 32mm and greater.  | Vertical Turbine pump complies?  | YES/NO  |
| 4.6.3    | Vertical Turbine Drivers - Non-Reverse Ratchet fitted to electric driver or Right Angled Gear Drive  | Non-Reverse Ratchet fitted   | YES/NO  |
| 4.6.4    | Right Angled Gear Drive rated power greater than max pump power Rqd Max Pump Power kW <input type="text"/>   | Right Angled Gear Drive Rating kW <input type="text"/> Is this power greater?  | YES/NO  |

|           |   |  |  |
|-----------|---|--|--|
| 4.7       | <b>Positive Displacement Pumps or Foam Pumps (Clauses 4.7 relate to foam pumps &amp; it's drivers only)</b>   |  |  |
| 4.7.4     | Pressure Relief Valve (PRV) to relief whole pump flow & set at pressure less than system component rating.  | Is PRV max flow equal or greater than pump max flow?   | YES/NO   |
| 4.7.5.1-3 | Pressure Unloader Valve (PUV) if fitted shall be in addition to PRV and operate Automatically & Manually.   | Is PUV fitted and is capable of auto/manual operation?   | YES/NO   |
| 4.7.6     | Pressure relief & Unloader discharge shall not be return to suction of pump.  | Does PRV & PUY discharge back to tank?   | YES/NO   |
| 4.7.10    | Suction Strainer fitted 10 pipe diameters from pump flange and mesh suit Pump & System requirements.  | Is strainer located 10 Dia. from pump. Mesh size suitable for pump & system?   | YES/NO   |
| 4.7.11    | Driver power sized for all design duties & Drive train loss.  | Is drive train power loss allowed in driver sizing?  | YES/NO   |
| 4.7.12    | Elec Driver shall be Close, Flexible or Timing Gear coupled. Diesel driver shall be coupled via centrifugal clutch  | Is coupling suitable for driver?   | YES/NO   |
| 8.2       | <b>Electric Fire Pump Drivers &amp; Controllers</b>   |  |  |
| 8.2.1     | Degree of Protection IP54   | Can you see a rubber sealant or gasketing to ensure door or viewing window sealing?  | YES/NO   |
| 8.2.2     | Is the Controller within site of the motor pump   | Can you see both the motor pump and the controller at the same time?   | YES/NO   |
| 8.2.3     | Control Cabinet & wiring connection/termination points minimum 300mm clearance from floor level .   | Is the control cabinet & any associated wiring connections points located 300 mm above the floor?  | YES/NO   |
| 8.2.4     | Pump circuit fitted with lockable isolator, that is also an overcurrent Circuit Breaker?  | Can you see a main switch that is a circuit breaker and is lockable in the "ON" position.  | YES/NO   |
| 8.2.5     | Fire pump motor shall attain full speed within 15s of start signal  | Initiate a start sequence and time the acceleration. Is the acceleration less than 15 Seconds?   | YES/NO   |
| 8.2.8     | Touch screens shall not be used for primary operations – start, stop or reset.  | Is there a touch screen? If yes can you start and stop the pump by buttons, not the screen?  | YES/NO   |
| 8.2.9     | All indicator lights shall be accessible for replacement. (If screen display it shall display all information at once)<br>Are the following indicators or displays provided:<br><b>GREEN INDICATOR FOR:</b> <span style="float: right;"><i>Tick boxes if compliant ( ✓ )</i></span><br>Power Available <input type="checkbox"/><br><b>RED INDICATORS FOR:</b><br>Power Fail <input type="checkbox"/> Battery Charge Supply Fail, <input type="checkbox"/><br>Pump Run <input type="checkbox"/> Aural alarm silenced. <input type="checkbox"/><br>Variable Speed Control Malfunction(if variable speed driver fitted) <input type="checkbox"/> | Are all the indicators separate ?(if touch screen display - large & displays all information)<br>Check off each indicator light. Are they ALL on the panel & nominated colour?   | YES/NO<br>YES/NO   |
| 8.2.11    | Aural alarm Integral or Remote to panel operates simultaneously with lights for:<br>Power Fail <input type="checkbox"/> Phase Fail <input type="checkbox"/> Pump Run <input type="checkbox"/><br>Indicator & Aural Alarm power supply via monitor Battery <span style="float: right;"><i>Tick boxes if compliant ( ✓ )</i></span>   | When there is a single phase power failure is there an indicator light and aural alarm?<br>When the pump is started is there an indicator light and Aural alarm?<br>When the main isolator is turned off is there an indicator on and an aural alarm?  | YES/NO<br>YES/NO<br>YES/NO   |
| 8.2.12    | Test facility provided for testing indicator lights & Aural Alarms  | Is there a "test Button" that lights all indicators and sounds the Aural alarm?  | YES/NO   |
| 8.2.13    | Ammeter provided to indicate motor current for each phase.  | is it possible to view and record the amps in each phase?  | YES/NO   |
| 8.2.15    | Battery - installed outside control panel on frame 150mm above floor,<br>Terminals covered,<br>2 years service life<br><br>AGM sealed type battery.<br>72AH rating<br>Identification plate fixed.   | Is the battery on a stand 150mm above the floor?<br>Are the terminals covered?<br>Is the battery marked with its initial installation date?<br>Is the battery date stamped?<br>Is that date less than 2 years prior to todays date?<br>Is the battery a sealed AGM type?<br>Is the battery at least 72AH capacity?<br>Is there an identification plate fitted? | YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO |
| 8.2.17    | Battery Charger-3 Stage Type - Boost, Absorption & Float<br>complete with ammeter and voltmeter.<br>Sensing wires direct to the battery shall be provided.  | Is it obvious that this is a 3 stage charger(branding? Labels?)<br>Is there an ammeter and a voltmeter<br>Is there a positive and a negative sensing wire(In addition to the main heavy duty cables)connected to the batteries?  | YES/NO<br>YES/NO<br>YES/NO   |

|                |   |   |  |
|----------------|---|---|--|
| 10.1           | <b>Shop Testing and Conformance</b>   |   |  |
| 10.2.1         | Hydrostatically Test each Fire pump to 1.5 times maximum working pressure or 2,400KPa minimum for minimum 5 minutes – Report per Figure F3  | Sighted Hydrostatic Test Certificate F3<br>Hydro Test Pressure & Period [ ] kPa [ ] Minutes   | YES/NO<br>YES/NO   |
| 10.2.2         | Ancillary equipment (pipe work & Valves) tested to above  | Sighted Ancillary Equipment Hydro-test Certificate  | YES/NO   |
| 10.3.1         | Main Fire Pump sets with Driver & Controller shall be performance tested to AS2417, Grade 2 as a complete assembly and certificate similar to Figure F1 provided.<br>Negative tolerances shall not be permitted for duty flow and head.   | Sighted Performance test F1<br>Was duty flow and head achieved without negative tolerance?  | YES/NO<br>YES/NO   |
| 10.3.3         | Electric Fire set tested 15mins & results Figure F4 provided  | Sighted Electric additional 15min run test F4   | YES/NO   |
| 10.3.5         | Controller Function test carried out. Results Figure F6 provided  | Sighted Controller Function Tests F6  | YES/NO   |
| 10.4           | Certificate of conformance provided for each Fire pump set with its respective serial number.<br>Pump characteristic curve calculated from the test data  | Certificate of conformance for S/N provided<br>Test Data & Curve Supplied   | YES/NO<br>YES/NO   |
| 11             | <b>Siting and Installation</b>  |   |  |
| 11.3           | Clearance around pump sets > 1m<br>Clearance between multiple pump sets > 0.6m  | Check 1m clearance available around pumpsets<br>Check 0.6m minimum clearance available between pumpsets   | YES/NO<br>YES/NO   |
| 11.5           | Adequate ventilation in pump room – Run pump sets for 30 mins with all doors shut.<br><i>Note 2 c/12.3.3(h) - If pump room temperature rises more than 10° C this could indicate inadequate ventilation.</i>  | Check pump room temperature rise after 30 mins of running < 10°C  | YES/NO   |
| 11.6           | Drainage provided in pump room - floor graded to drain  | Check spillage water drains towards drainage  | YES/NO   |
| 11.7           | Concrete Plinth to 150mm High<br>Pump set baseplate mounted on concrete plinths with 150mm clearance all around baseplate.  | Plinth Height [ ] mm<br>Plinth edge to base frame clearance [ ] mm  | YES/NO<br>YES/NO   |
| Appendix D     | <b>Is the pump room:</b><br><br>Note: The internal air temperature of the pump room should not exceed 50°C when measured at the engine air cleaner and with the pump room doors closed under any operating conditions.<br>AS2118.1 Appendix H: During 30minute run at duty with pump room doors closed, the pump room temperature should not rise more than 10°C above ambient temperature. | Secured to prevent the entry of unauthorized persons?<br>Where necessary heated to maintain the temperature above 4°C?<br>Identified by signs and other visual and audible aids?<br>A minimum of 2.1m high internal clearance and sufficient space for pump maintenance?<br>Waterproof?<br>As close as practical to the water source?<br>If a booster connection is provided is the pump house within 20m of a hardstand area?<br>Is the pump house sprinkler protected in accordance with AS2118.1, AS2118.4 and AS2118.6?<br>Are the doors self-closing?<br>Does the pump room have a door leading to a road or open space, maybe via an airlock or smoke lobby, pressurized in accordance with AS1668.1 leading to a fire isolated passageway?<br>Is Emergency lighting complying with AS2293.1 provided to the pump room?<br>Is the pump house/room adequately ventilated?<br>Is provision made for drainage of water from the pump house and the floor graded? | YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO<br>YES/NO |
| 12.1 to 12.4.3 | <b>Commissioning test report per Section 12</b><br>Electric Fire Pump set Commissioning Report to Clause 12.2.3 & 12.2.4  | Sighted Electric Fire Pump set Commissioning Report?  | YES/NO   |

**ELECTRIC PUMP SET LABELS:**

|           |   |        |
|-----------|---|--------|
| cl.3.13.1 | Are identification plates securely fixed and of <b>durable corrosion resistant material</b> ? | YES/NO |
| cl.3.13.1 | Is the lettering on the identification plates embossed or engraved and legible?               | YES/NO |

**PUMPSET LABEL cl.3.13.2**

Is this label complete and attached to the baseplate?  YES/NO

Manufacturer's Name & Address:

Flow:  L/s or L/min      Head:  m

Speed:  rpm      Pump Max. Power:  kW

Max. Test Flow:  L/s or L/min

Pumpset Serial No.:

**PUMP LABEL cl.3.13.3**

Is this label complete and attached to the pump?  YES/NO

Pump Manufacturer's Name:

Pump Model Designation:

Number of Stages:

Impeller Dia.:  mm

Pump Serial No.

**ELECTRIC MOTOR LABEL cl.3.13.4**

Is this label complete and attached to the motor?  YES/NO

Electric Motor Manufacturer's Name:

Model No.:       Serial No.

Power Rating kW:

Voltage:       Amperes:       RPM:

Hertz:       P.F.:       IP Rating:

Connection:       Insulation Class:

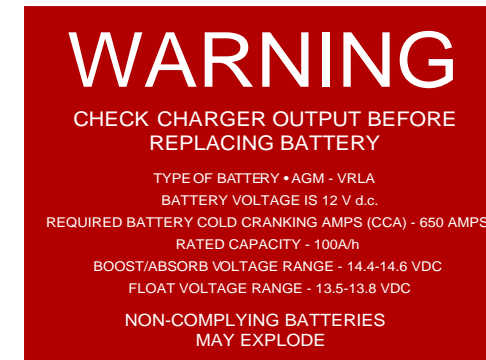
**WARNING SIGN cl.3.11.3**

Is a similar label attached to the pumpset?  YES/NO



**Typical BATTERY WARNING cl.3.13.6**

Is a similar label attached to the battery enclosure or cover?  YES/NO



**DIRECTION OF ROTATION cl.4.1.10**

Is this label attached to the pump?   YES/NO

**WIRING DIAGRAM cl.8.2.18**

Is a wiring diagram permanently attached to the controller?  YES/NO

Controller Wiring Diagram complete with terminal numbering

**ELECTRIC FIRE PUMP CONTROLLER LABEL, cl.8.2.19**

Is this label complete and attached to the controller?  YES/NO

Manufacturer's Name & Address:

Identification No.:

kW Rating:       Voltage:

Amperes:       Phases:

Serial No.:

Has 100% correct score been achieved?

IF NO then the site has failed and must be referred for full inspection of all items to AS2941-2013.