Maintenance visit checklist

This checklist applies to all aspects of the SCS: infrastructure and user devices/installations. For each of the key installations, i.e. SOC, repeater sites and vehicles, there are three types of checks:

1. **Visual Inspection**: to identify any obvious configuration issues, mechanical faults and damages. Do not require any tools or instruments. It is advised to take pictures to document findings.
2. **Functional checks**: these aim to verify that the installation/devices operate normally (as expected). Do not require any instruments but some basic tools might be needed.
3. **Performance tests:** These tests are meant to verify the actual performance of the installation/service. These tests will require, at least, basic tools and instruments: SWR meter and multimeter.

|  |  |
| --- | --- |
| Security Operations Centres | Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Visual inspection | **Chkd** | **Comments/Follow Up** |
| Check that the equipment is clean: |  |  |
| No dust or dirt on the equipment, especially areas that provides cooling: cooling fins, fans etc. |  |  |
| Check RF connectors: |  |  |
| Appropriately screwed tight |  |  |
| Cable is properly fixed onto the connector. |  |  |
| Center wire is properly soldered or crimped into the connector |  |  |
| Connectors outside are protected by self-vulcanizing tape |  |  |
| Lightning arrestors |  |  |
| All radio antenna cables (HF/VHF/UHF) have lightning arrestors installed. |  |  |
| Connectors are tightened appropriately and protected with self-vulcanizing tape |  |  |
| Ground cable(s) are not damaged and properly fixed to the lightning arrestors and the grounding point. |  |  |
| Antenna system |  |  |
| Check for any visible damage to the cable: cuts, kinks, excessive twists. |  |  |
| Ensure bending radius of antenna cables are not excessive. |  |  |
| Antenna has no visible damage |  |  |
| The antenna cable fixing points (between radios and antenna) are not damaged and all complete.  |  |  |
| Antenna strain relief at the antenna side is not damaged and complete. |  |  |
| The antenna is fixed solidly to the tower/mast and remain in intended configuration (as per manufacturer’s recommendations). |  |  |
| Towers and masts |  |  |
| Check for corrosion (if applicable) |  |  |
| Verify that grounding cables and points are properly fixed. |  |  |
| Verify antenna brackets show no sign of corrosion and appear to be securely attached |  |  |
| Verify that the structure is not leaning or is twisted |  |  |
| Check tension in guy wires (if applicable). |  |  |
| Verify that warning light on the top is operational (if applicable) |  |  |
| Cable Tray (if applicable) |  |  |
| Verify that trays are properly mounted |  |  |
| Ensure cables are appropriately fixed in the tray, i.e. tie-wraps etc. |  |  |
| Check if cables are not damaged (flattened) |  |  |
| Power supply system |  |  |
| Verify that battery terminals are free of corrosion and that battery terminals have been protected from further corrosion (Petroleum Jelly, conductive grease etc). |  |  |
| Check cable connectors/terminals and ensure they are properly fixed/crimped onto the cables. |  |  |
| Equipment/cabling is hazard free, no open wire connections |  |  |
| Verify that battery ventilation system (if applicable) is complete and fully functional |  |  |
| Check that solar panels are free of dust, sand and dirt. |  |  |
| Verify that solar panels fixings (fixed to a solid object (ground, roof etc)) are complete and functional. Panel indicators meter is reading correctly |  |  |
| If powered by more than one source, ie AC and a battery DC, verify both sources are functional and providing power. |  |  |
| Verify that visual indicators (lights) are showing normal status: |  |  |
| Equipment are on and blinking green for activity (where applicable).  |  |  |
| Check if there are any RED indicators on the equipment that could suggest a fault or issue. Keep in mind the red light is active on some of the devices when transmitting or powered on.  |  |  |
| Grounding |  |  |
| Check all grounding attachment point for corrosion and that the cables are properly fixed with bolts and nuts. Also, verify that cables lugs are properly crimped onto the cable and are not loose. |  |  |
| Check grounding stakes are not loose.  |  |  |
| Is the equipment rack and/or the hardware properly grounded? |  |  |
| Check Dispatcher Consoles (If applicable) |  |  |
| Check if PC is turned on and LAN connected. |  |  |
| Check if Dispatcher software is running. |  |  |
| Any visual RED indicated connection error in the software bottom line |  |  |
| Are PTT buttons active (Not grayed out) |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Functional checks | **Chkd** | **Comments/Follow Up** |
| VHF/UHF radios: make a test call to a second user on all the repeater channels as well as a simplex channel available. Test especially for the ‘Network Controller’: verify that it can send the SelectV tone (hear if the CCIR 20ms is used) and test stun and un-stun commands to user devices. |  |  |
| HF radios: Base radio – make a ‘Selective Call’ to a remote station, i.e. a SOC. After the remote station responds, ask them to return the call. Set the HF base to scan and answer the call when it is received.  |  |  |
| Satellite Phones: check that the terminal is logged onto the network and is ready to receive/make calls. Verify that the subscription is current and valid. Make a test call to another sat phone, or mobile, or fixed line  |  |  |
| Mobile phones: verify that the subscription is active and that there is credit for airtime/data (if pre-paid subscription). Ensure there is sufficient signal in the SOC for the phone to provide required services: voice, SMS and data |  |  |
| Check if despatcher is functioning |  |  |
| Power backup: disconnect the primary power source from the system being tested. Verify that the backup provides power to the system without interruption.  |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Performance testing | **Chkd** | **Comments/Follow Up** |
| HF/VHF/UHF base radios: check SWR and power-output. Record readings and compare with previous data.  |  |  |
| Disconnect backup batteries, one by one, from the charger and measure its voltage. Voltage should be above 12.5V. If lower, the battery might be faulty or performance is low.  |  |  |
| Check backup battery bank’s capacity to provide back-up power: disconnect primary power source and allow the equipment to operate from the backup power for a period of at least 20 min. A transmission with the HF radio can be done to see if battery hold its voltage |  |  |
| Verify that change over between primary and backup power is smooth. For example, changed between electrical supply(main) to battery bank and from battery bank to main generator is smooth. |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |
| --- | --- |
| Repeater sites | **Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Visual inspection | **Chkd** | **Comments/Follow Up** |
| Check RF connectors |  |  |
| Appropriately screwed tight to the repeater and antenna |  |  |
| Cable is properly fixed onto the connector. |  |  |
| Center wire is properly soldered or crimped into the connector |  |  |
| Connectors outside are protected by self-vulcanizing tape |  |  |
| Lightning arrestors |  |  |
| All antenna cables have lightning arrestors installed. |  |  |
| Connectors are tightened appropriately and protected with self-vulcanizing tape |  |  |
| Ground cable(s) are not damaged and properly fixed to the lightning arrestors and the grounding point. |  |  |
| Antenna system |  |  |
| Check for any visible damage to the cable: cuts, kinks, excessive twists. |  |  |
| Ensure bending radius of antenna cables are not excessive. |  |  |
| Antenna has no visible damage |  |  |
| The antenna cable fixing points (between repeater and antenna) are not damaged and all complete.  |  |  |
| Antenna strain relief at the antenna side is not damaged and complete. |  |  |
| Multicoupler has power, AC/DC (If applicable) |  |  |
| The antenna is fixed solidly to the tower/mast and remain in intended configuration (as per manufacturer’s recommendations). |  |  |
| Towers and masts |  |  |
| Check for corrosion (if applicable) |  |  |
| Verify that grounding cables and points are properly fixed. |  |  |
| Verify that antenna fixing brackets show no sign of corrosion and appear to be securely attached |  |  |
| Verify that the structure is not leaning or is twisted |  |  |
| Check tension in guy wires (If applicable) |  |  |
| Verify that warning light on the top is operational (If applicable) |  |  |
| Cable Tray (if applicable) |  |  |
| Verify that trays are properly mounted |  |  |
| Check if cables are not damaged (flattened) |  |  |
| Ensure cables are appropriately fixed in the tray, i.e. tie-wraps etc. |  |  |
| Power supply system |  |  |
| Verify that battery terminals are free of corrosion and that battery terminals have been protected from further corrosion (Petroleum Jelly, conductive grease etc). |  |  |
| Check cable connectors/terminals and ensure they are properly fixed/crimped onto the cables. |  |  |
| Equipment/cabling is hazard free, no open wire connections Router and switch are on and blinking green for activity. |  |  |
| Verify that battery ventilation systems are complete and fully functional (If applicable) |  |  |
| Check that solar panels are free of dust, sand and dirt. |  |  |
| Verify that solar panels fixings (fixed to a solid object (ground, roof etc.)) are complete and functional. Meter panel indicators are reading correctly |  |  |
| Check if equipment is powered: AC and/or DC |  |  |
| Verify that visual indicators (lights) are showing normal status: |  |  |
| Equipment are on and blinking green for activity (where applicable).  |  |  |
| Check if there are any RED indicators on the equipment that could suggest a fault or issue. Keep in mind the red light is active on some of the devices when transmitting or powered on.  |  |  |
| Grounding |  |  |
| Check all grounding attachment point for corrosion and that the cables are properly fixed with bolts and nuts. Also, verify that cables lugs are properly crimped onto the cable and are not loose. |  |  |
| Check grounding stakes are not loose.  |  |  |
| Verify that the equipment rack and/or the hardware is properly grounded. |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Functional checks | **Chkd** | **Comments/Follow Up** |
| Make a test call from a user device to a user farther away from the repeater site, i.e. a SOC. |  |  |
| Power backup: disconnect the primary power source from the system being tested. Verify that the backup provides power to the system without interruption.  |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Performance testing | **Chkd** | **Comments/Follow Up** |
| Check SWR and power-output. Record readings and compare with previous data.  |  |  |
| Disconnect backup batteries, one by one, from the charger and measure its voltage. Voltage should be above 12.5V. If lower, the battery might be faulty or performance is low.  |  |  |
| Check backup battery bank’s capacity to provide back-up power: disconnect primary power source and allow the equipment to operate from the backup power for a period of at least 20 min.  |  |  |
| Verify that change over between primary and backup power is smooth. For example, changed between electrical supply(main) to battery bank and from battery bank to main generator is smooth. |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |
| --- | --- |
| Vehicles | Location/Reg.#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Visual inspection | **Chkd** | **Comments/Follow Up** |
| Equipment installation |  |  |
| Devices are securely affixed in vehicle harness/cradle. |  |  |
| Handset and cable brackets/supports are in place and fixed properly |  |  |
| Required shock mounts for cradles/harness are in place and functional |  |  |
| Check RF connectors |  |  |
| Appropriately screwed tight  |  |  |
| Cable is properly fixed onto the connector. |  |  |
| Center wire is properly soldered or crimped into the connector |  |  |
| Connectors outside are protected by self-vulcanizing tape |  |  |
| Antenna system (apply to all RF equipment) |  |  |
| Check for any visible damage to the cable: cuts, kinks, excessive twists. |  |  |
| Antenna strain relief at the antenna side is not damaged and is complete. |  |  |
| Antenna cable is secured along path from RF device (radio, SatPhone) to the antenna |  |  |
| Antenna mount is fixed solidly to the vehicle and remain in intended configuration, for example, VHF whip is straight and not tilted backwards or tucked under roof rack etc. |  |  |
| Antenna has no visible damage |  |  |
| Antennas and connections are properly isolated (not touching or rubbing) from body of vehicle |  |  |
| Power supply system |  |  |
| Verify that battery terminals are free of corrosion and that battery terminals have been protected from further corrosion (Petroleum Jelly, conductive grease etc). |  |  |
| Check cable connectors/terminals and ensure they are properly fixed/crimped onto the cables. |  |  |
| Equipment/cabling is hazard free, no open wire connections |  |  |
| Battery is in a fixed location (no risk of movement that could cause shorting) |  |  |
| Grounding |  |  |
| Check all grounding attachment point for corrosion and that the cables are properly fixed with bolts/nuts to the chassis. |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Functional checks | **Chkd** | **Comments/Follow Up** |
| VHF/UHF radios: make a test call to a second user on all the repeater channels as well as a simplex channel available.  |  |  |
| HF radios: Mobile radios – make a Selective Call to a remote station (not a station in the same location as the vehicle), i.e. SOC. After the remote station responds, ask them to return the call. Set the HF base to scan and answer the call when it is received. In addition, make three ‘Test Calls’, on three different frequencies, ie low, mid and high part of the band and verify that the automatic tuning antenna tunes properly. |  |  |
| Satellite Phones: check that the terminal is logged onto the network and is ready to receive/make calls. Verify that the subscription is current and valid. |  |  |
| Battery check where HF radio is being used without engine running to check condition of the vehicle battery |  |  |
|  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |

|  |  |  |
| --- | --- | --- |
| Performance testing | **Chkd** | **Comments/Follow Up** |
| HF/VHF/UHF base radios: check SWR and power-output. Record readings and compare with previous data.  |  |  |
|

|  |  |
| --- | --- |
| Responsible for checks (Name/Signature):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

 |