# Specification of Stand-by Generators Maintenance Contract

**Objectives:**

- Jordan Civil Aviation Regulatory Commissions (JCAR) is seeking for a maintenance contract for the backup Diesel Generators distributed to its building and stations listed in the ANNEX .
- The contractor shall commit to carry out a site survey to the generators before applying for the bid.

**Introduction :**

**Maintenance Levels:**

The international regulation define % levels of maintenance depending mainly on the complexity of the operations to realize the corrective , preventative and evaluative actions may belong to anyone of these levels.

**Level 1:** The First-level maintenance actions are the actions having low level of complexity , they have to be performed for the operations and realized on part easily accessible , with safety , owing to supporting parts integrated in the equipment. They are for example the adjustments, controls or inspections , the elementary preventative maintenance actions, the replacement of accessories or consumables ( fuses, bulb etc...) . This kind of actions may be performed by the operator (CARC technical staff) after coordinating with the contractor using integrated tools and the operating manual .

**Level 2:** The second-level maintenance deals with maintenance actions to perform owing to simple procedures and/or support equipment's ( integrated or exterior) which use is simple. They are for example , the performance controls , some tuning , and the repair by easy standard replacement pf parts or groups of parts . The kind of maintenance can be realized (Performed ) by an authorized staff with the support of the detailed procedures and the tools defined in the

maintenance manual . The operations of part replacement without need for the full dismantle of the equipment are concerned . It is then a work concerning isolated parts or the simple control of performance .

**Level 3:** The third-level maintenance deal with the operations demanding complex procedures and/or tools difficult to use . it is for example the global tuning , the sensitive systematic maintenance operations, the repairs by exchange the components , these actions imply a deep knowledge of the equipment and need to take into account several elements, their interactions and the consistency .

**Level 4 :** The fourth-level maintenance is the operation which procedure imply the mastering of specific technologies and/or the use of specialized equipment's or tools. They are for example the specialized repairs , the control of the measurement instruments.

**Level 5:** It is the refurbishment or renovating actions which procedures imply knowledge on specific technologies , process and/or tools.

## Requirements:

1. The contractor's license must include **maintenance of electrical generators.**
2. It is preferable to be a brand agent for a generator
3. The contractor shall comply with all levels of maintenance mentioned in the introduction
4. The contractor shall be responsible for the maintenance of the mechanical and electrical components in addition to automatic transfer switch (ATS)
5. The contractor shall submit the following after each visit:

| تبديل | صيانة | تفقد | النظام ومكوناته |
|---|---|---|---|
| | | | نظام التبريد |
| | | | نظام التزييت |
| | | | نظام الوقود |
| | | | نظام الكهرباء |
| | | | نظام الهواء |

6. **The maintenance contract will remain valid for 24 months ( Two calendar year ).**
7. **Qualifications and experiences of the maintenance staff must be provided (at least 5 technician / engineer)**
8. **The maintenance staff must be registered with the Social Security Corporation**
9. The maintenance team must consist of **at least two qualified and experienced technician/engineers** who have the necessary **security clearances to enter airports.**
10. Transportation from Amman-to-all airports ,and all sites visit, are the contractor responsibility , including accommodation fees & all other requirements and expenses
11. In case of failure of any generator under responsibility of queen alia airport and Marka airport , the contractor shall be on site within two hours and repair the faults as soon as possible .

12. In case of failure of any generator under responsibility of king Hussein airport (Aqaba) the contractor shall be on site within 5 hours and repair the fault as soon as possible.
13. Preventive maintenance, including required manpower, transportation fees, accommodation fees & all other requirements and expenses, is contractor responsibility
    - Periodicity of maintenance are:
        - Monthly
        - Semi-Annual
        - Annual
    - Maintenance Task details : All maintenance tasks to be as per manufacturer recommendation.

**When required:**

- Battery- Recycle
- Battery cable – disconnect
- Circuit Breaker-Reset
- Fuel System – prime
- Generator Bearing – Lubricate
- Generator Load-check
- Generator Set-test
- Generator set alignment – check
- Generator winding – test
- Maintenance Recommendation

**Monthly :**

- Annunciator panel – inspect
- Automatic start/stop – inspect
- Battery charger – check
- Battery electrolyte level – check
- Cooling system coolant level – check
- Electrical connections – check
- Engine air cleaner service indicator – inspect

- Engine air pre-cleaner – clean
- Engine oil filter differential pressure – check
- Engine oil level – check
- Engine system fuel filter differential pressure – check
- Engine oil level – check
- Fuel system fuel filter differential pressure – check
- Fuel tank water and sediment – drain
- Generator – inspect
- Generator bearing temperature – test / record
- Generator lead- check
- Jacket water heat – check
- Space heater – test
- Standby generator set maintenance recommendation
- Stator winding temperature – test
- Voltage and frequency – check
- Walk around – inspect
- Clean and blow the generator body

**Semi- annual :**

- Alternator – inspect
- Belts – inspect / adjust / replace
- Cooling system coolant sample ( level 1 ) – obtain
- Colling system supplemental coolant additive ( SCA) –TEST/ADD
- Crankshaft vibration damper – inspection
- Engine – clean
- Engine Air cleaner ( dual element ) – clean / replace
- Engine Air cleaner ( single element ) – clean / replace
- Engine mounts – check
- Engine oil sample – obtain
- Engine oil and filter – change
- Engine proactive devices – adjust
- Fan drive bearing – lubricate
- Fuel injector – inspect/adjust

**Annual :**

- Air shutoff – test
- Alternator – inspect
- Belt – inspector / adjust/ replace
- Cooling system coolant sample (level 2 ) – obtain
- Cooling system supplemental coolant additive ( SCA) – test / add
- Crankshaft vibration damper – inspect
- Engine - clean
- Engine Air cleaner ( dual element ) – clean / replace
- Engine Air cleaner ( single element ) – clean / replace
- Engine crankcase breather – clean
- Engine mounts –check
- Engine oil sample – obtain
- Engine oil and filter – change
- Engine protective devices – check
- Engine Valve Lash – inspect/adjust
- Fan drive bearing – Lubricate
- Fuel injector – inspect/adjust
- Fuel system primary filter – clean/inspect/replace
- Fuel system secondary filter – replace
- Generator Bearing – inspect
- Generator set vibration – test / record
- Generator winding insulation – test
- Hoses and clamps – inspect / respace
- Radiator – clean
- Rotating rectifier – inspect/test
- Speed sensor – clean/inspect
- Starting motor – inspect
- Stator lead-check
- Varistor-check
- Varistor – inspect
- Water Rump – inspect

14. In case of failure where it is required to send the stand by generator to workshop for repair and temporary equivalent generator is required during period, the contractor will be committed to connect such generator provided by Jordan civil aviation regulatory commission (JCARC)

15. In case of failure, failure will be reported to the following contracts 24 hours /days week:

| | | |
|---|---|---|
| 1. | Ibrahim Riyad | Head of Maintenance & Support Services for CNS |
| 2. | Wesam Jebreen | Head of Radar maintenance Division |
| 3. | Mahmoud Hatem | Head of COM/NAV Division - QAIA |
| 4. | Taghreed Assad | Head of COM/NAV Division - KHIA |
| 5. | Hala Alrawashda | Head of COM/NAV Division - AMN |

## Warranties and Responsibilities:

The contractor warrants the following:

a) The service shall be performed in accordance with the best industry practices.
b) Without prejudice, if any deficiency (whether in workmanship or the materials employed) results from or arises under the services performed by the contractor in connection with the services , the contractor undertakes to remedy such work within the time frame set by the JCARC , replace the parts concerned if necessary by a fully serviceable parts and to remedy any resulting damages , at no cost or expense to JCARC
c) Comply with all applicable laws, statutory and regulatory requirements.
d) Refueling the internal tank from the external tank when required
e) Provision of the fuel is JCARC's responsibility.
**f) Preventive maintenance, shall include all requirements for change oil with filters, diesel filter & Coolant for radiator (once a year) for all generators**
g) Preventive maintenance shall include on-load test the generator for at least 30 min.
h) The contractor should provide a preventive maintenance report after each visit including check list and recommendations.
i) The service provider shall take all safety measures and required equipment to ensure safety at workplace
j) The service provider shall provide corrective maintenance in case of failure ATS panel and all connection
k) The contractor shall provide a corrective maintenance report after the visit including fault analysis and used spare parts.
l) A list of recommended necessary spare parts shall be provided with itemized prices.

## CARC Standby Generators List

| No | Station | Manufacturer | Engine | Alternator | (KVA) | Location |
|---|---|---|---|---|---|---|
| 1 | Amman Airport CARC | GUCBIR | RICARDO | Maranello | 40 | Marka |
| 2 | Amman Airport TWR | Olympian | PERKINS | | 220 | Marka |
| 3 | AMN DVOR | Countryman | PERKINS | STAMFORD | 52 | Al-rusaifa |
| 4 | AA VHF | Teksan | PERKINS | Marelli | 80 | Abu Alanda |
| 5 | QAIA TWR (main) | MARATHON ELECTRIC | Detroit | Magna | 569 | QAIA |
| 6 | QAIA TWR (standby) | MARATHON ELECTRIC | Detroit | Magna | 569 | QAIA |
| 7 | INDRA RADAR | HIMOINSA | YANMAR | MECCALTE | 42.5 | Radar Head |
| 8 | THALES RADAR | GHADDAR | PERKINS | STAMFORD | 35 | Radar Head |
| 9 | ELDIS RADAR | CATERPILLAR | CATERPILLAR | CATERPILLAR | 45 | QAIA |
| 10 | QAA DVOR | PI | PERKINS | STAMFORD | 40 | QAIA |
| 11 | QTR DVOR | Onis VISA | JOHN DEERE | Marelli | 255 | Al-qatraneh |
| 12 | Aqaba Airport TWR | Onis VISA | JOHN DEERE | Marelli | 220 | Aqaba |
| 13 | Aqaba DVOR | | LISTER-PETTER | LEROY SOMER | 13 | Aqaba |
| 14 | Mobile generator (1) | GHADDAR | PERKINS | STAMFORD | 35 | QAIA |
| 15 | Mobile generator (2) | GHADDAR | PERKINS | STAMFORD | 35 | QAIA |