CARC
هيئة تنظيم الطيران المدني
CIVIL AVIATION REGULATORY COMMISSION

The HW & SW Upgrade of the MSSR-S 20 MP/S Operating System

VISIT FOR A COMPLETE REVIEW OF THE SYSTEM

(in terms of HW status and performance)

1.0 Introduction

1.1 Description of the system

IRS-20MP/S MSSR Mode S Interrogator is a Dual Channel system. Each channel is composed of:

- Mode S Transmitter: composed by EMU, SDU, SAU and CTU
- Transmitter-Receiver-Antenna Interface Unit (TRA)
- Transmitter Power Supply Module (TPS)
- Transmitter Fan Unit (TFU)
- Multi-channel Receiver Unit (MRU)
- Mode S Power Supply Extractor Unit (MFEX)
- Mode S Extractor Fan Unit (MVEX)
- Mode S Extractor (MEX)

Each channel is connected to one port of the RRF (RF Relay). Through this, the channel in main state is connected to the antenna, and the stand-by channel is connected to 50Ω dummy loads or UTS unit when it is included in the system. The RRF is used to change the channel in main state.

1.2 Aim

Jordan Civil Aviation Regulatory Commission (CARC) requests a site visit to the INDRA SENSOR [MSSR-S 20 MP/S],that had been installed since 2011, to inspect, diagnose, analyze, and propose any upgrades to its system on both the hardware and software levels (HW & SW).

2.0 General conditions

2.1 Expected tasks to be performed

The Following are some of the expected tasks/outcomes of the visit:

1. An update of the SW of the MSSR-S system to an agreed version.
2. A 1-year warranty applicable to the updated SW.
3. Project management, administration and documentation should be delivered.
4. A final intervention report containing detailed information of the activities performed and conclusions obtained.
5. Review and verify that the system meets the required specifications at the HW level and if not, to identify the modules that present a malfunction.
6. Review and verify the performance of the system, with recordings and performance analysis (Eurocontrol tool).
7. Complete HW performance overhaul per specifications (extended preventive maintenance). The overhaul procedures will consist of performing the following procedures/tests:
    a. Measurement of power supply.
    b. Internal VSWR, transmit and receive losses
    c. Measurement of RF cables
    d. Transmission frequency
    e. Transmission spectrum
    f. Measurement of spacing, rise time, fall time and width of interrogation pulses
    g. Measurement of transmit power levels
    h. CTRA measurements
    i. Receiver raw video output
    j. Receiver nominal frequency
    k. Receiver bandwidth
    l. Receiver dynamic range
    m. Receiver tangential sensitivity
    n. Receiver band rejection
    o. Receiver frequency image rejection
    p. Extractor antenna interface measurement (ARP/ACP signals)
    q. Sensitivity and number of false pulses
    r. Mono-pulse curve generation

8. Check of system performance:
    a. Recording and analysis of radar data.
    b. System performance evaluation (both channels).
9. Final backup of the entire system.
10. Corrective maintenance to be analyzed on site to isolate and solve the following issues:
    a. MCPU issue. (two faulty MCPUs)
    b. EMU problem
    c. CTRA problem
    d. RF switch failure.
11. Radar SW & FW upgrade, the following items will be upgraded:
    a. MEX – SW and FW
    b. SLG-1 – SW
    c. SLG-2 SW
12. Upgrade and configuration of both MEX and available spare parts.
    a. SW upgrade and configuration of the SLG1/SLG2.
    b. Parameters adaptation to the most suitable configuration to assure the minimum performance requirements.
    c. Radar data recordings and analysis to verify the performance requirements are met
13. Checking the UTS and update the SW & FW components
14. Final intervention report must at least contain:
    a. The results of the HW tests performed.
    b. The non-compliances of the modules with performance deficiencies (if any).
    c. The results of the performance and detection performance of the system.
15. One day training for the staff

Note: All necessary test equipment are available except for the power meter which is not available.

3.0 Payment plan

1.	Down Payment	50 %
2.	After Site Visit	50 %

THE END