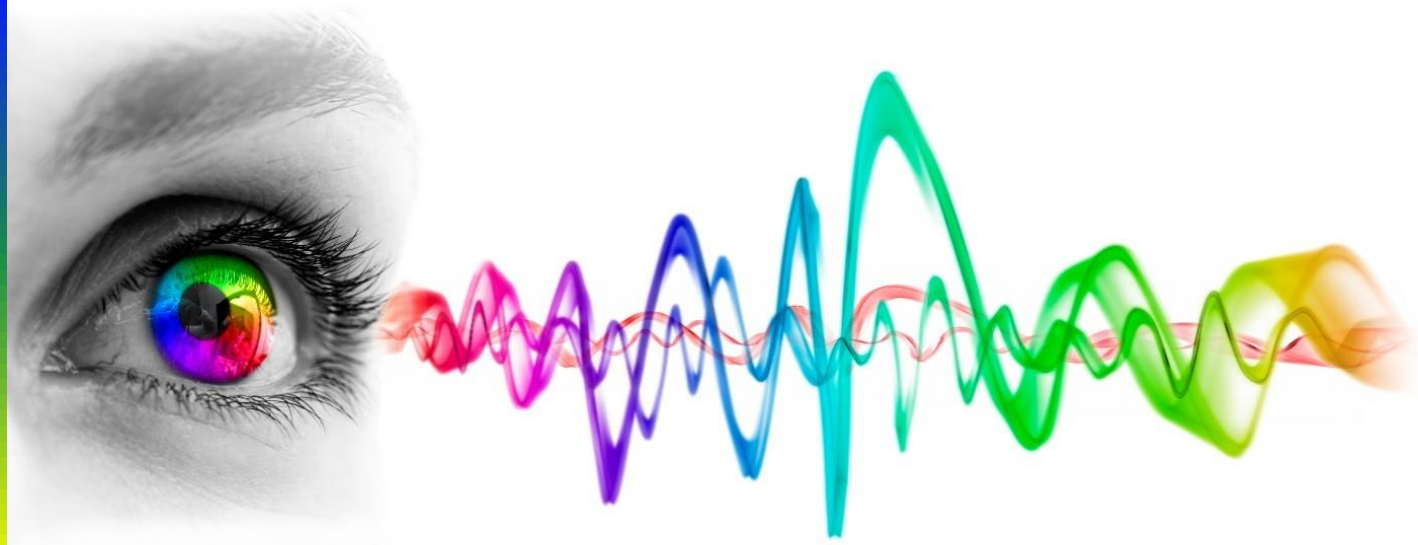


FM PROJECT - TURKMENISTAN



30 November 2023

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1 INTRODUCTION

LS of South Africa Radio Communications recently completed an FM Project for a customer based in Turkmenistan in conjunction with LS telcom AG in Germany.

The project entailed the planning, installation and commissioning of a FM Network comprised of 68 transmitter sites and a Network Operation Centre NOC based in the capital, Ashgabat.

1.1 Background

LS of South Africa Radio Communication Services now has the full capability to perform all aspects related to planning, installation, and commissioning of DTT, T-DAB and FM network deployment worldwide.

During the COVID-19 pandemic LS telcom won a FM tender for Turkmenistan. The tender was to provide, project-manage, install and commission 68 transmitter stations with transmitter equipment. 36 of the transmitter stations had to be provided with new antenna systems as well. The transmitter configurations varied from N+1 to 1+1 to dual exciter configurations. The fact that this tender was awarded during COVID-19 led to additional challenges relating to shortage of certain chip sets, slow delivery, and manufacturing as well as many travel restrictions between countries.

This tender is not just a supply and installation of the transmitter equipment. We had to setup a Network Operations Centre in Ashgabat that can communicate with all 68 transmitter stations throughout Turkmenistan to constantly display the statuses of the transmitters on a real time basis.

The different transmitter configurations also asked for automatic switching between transmitters during certain fault conditions. We therefore had to design the logics for all the transmitter configurations switching and test such configurations at our equipment rack assembly and design center in South Africa.

The project also asked for audio program feed arrangements that had to be set-up. No information was available on the formats and coding of the different audio streams. The links between the transmitter stations and the Network Operations Centre are done through the cellular network of which the topology and network configuration was unknown to us.

Once the racks were completed, wired, and assembled it was transmitted to Turkmenistan where it was populated with the transmitters and other equipment. All functionality was tested before it was brought into operation. Site Acceptance Testing was finally performed as part of the hand-over process.

The most challenges we experienced were linked to the following:

- Different audio formats which had to be standardized for satellite feeds.
- Local configurations of the mobile network which are unique to the country
- Transport logistics from the different suppliers around the world which included sea-freight, air freight and road freight
- Supply logistics of equipment during COVID-19 due to a scarcity of certain components and slow manufacturing schedules

The 68 transmitter site installations were finalized in March 2023.

This project is our largest FM radio project ever performed and gives us the capability to do the design and integration of broadcast transmitters and associated equipment on a manufacturer agnostic basis consider the following:

- Broadcast transmitters and standby configuration
- RF combiner and automated RF switching
- Integration of sensors for remote status verification and switching
- Logic designs
- Network Operations Centre design, installation, and reporting
- Mains stabilization and backup including lightning protection
- Audio feed arrangements with standby
- Antenna coverage design and integration
- Audio, RF, and coverage QoS measurement verification

We are ready to offer these services worldwide and for all broadcast technologies.