ARCS Project Case Study

Public Transport Authority of Western Australia (PTA)
Noise Monitoring System

Background.

The Fremantle Port area was a storage and warehouse area serviced by narrow gauge freight railway from Fremantle. Over time this area has evolved into a modern housing area where developers created high density housing in and around the warehouse area and along the railway corridor. The original freight railway continues to operate and trains run regularly through this now built up area. Due to the change in demographics the tolerance to noise from the rail operations and wheel noise, particularly on a curved section abutting new housing developments decreased.

In an effort to reduce the increasing number of complaints from the local residents and the noise created by the squeal from the wheel rail interface the Public Transport Authority deployed a track watering system. The system incorporated a series of watering sprays directed onto the track and activated when an approaching train is detected.

Although the system reduced the wheel rail squeal when operating the local residents continued to make complaints that there was ongoing noise issues and the system was either not working or when it did it was not effective.

The Public Transport Authority engaged ARCS to design and deploy a noise monitoring system to monitor the operation of the watering system and record the noise of each train movement through the area. This resultant evidence could then be used to monitor the systems operation and defend the ongoing complaints.

Solution

The ARCS system design was both simple and effective and involved the development of a system that monitored the watering systems and rail operation via a CCTV camera and noise recording. Footage together with the audio is stored on a locally mounted digital video recorder (DVR).

The system is remotely monitored periodically to verify correct operation by downloading archived clips of the passing trains. The maintainer is able to see the train and the watering system in operation and determine from the audio and CCTV whether the system is operating correctly and / or requires maintenance.

The system detects approaching trains using magnetic switches at an approach distance of 400m and initiates a watering start at the main problem area of track. The two approach detectors and the centralised DVR and controller communicate using 3G. Footage is also accessed remotely using 3G. CCTV images and footage are recorded for each train movement.

The system has effectively eliminated resident complaints since it was commissioned in mid 2013.