

case study



Remote Bridge Monitoring and Control System

Rail bridges employ little capability to detect the ingress of suspicious persons and materials. This particular bridge in Washington, DC (location cannot be divulged) was identified for hardening in that it “lives” in the heart of the nation’s capitol.

**Rail Bridge,
Wilmington, NC**

CHALLENGE

Approximately 1.7 million rail cars carrying hazardous material (including ordinance) move annually through the United States and Canada. Terrorists undoubtedly regard shipments of hazardous/nuclear materials and military equipment as target opportunities. The consequences of an attack could be significant. Bridges are particularly vulnerable to attack by explosives and chemical/biological agents.

SOLUTION

The **Bridge Security System** is used to monitor and control a bridge operation in Washington, DC. A combination of intelligent technologies was used to develop the system. This system is typical of Duos’ approach to critical high-risk bridge security.

Control and monitoring is effected using a dedicated control console (DCC) or a remote control terminal (RCT). The system incorporates intelligent video, radar, sonar, and audio technologies as well as redundant Programmable Logic Controllers (PLCs), and a Safety PLC. The system automatically detects intruders and suspicious objects left behind (or removed) within a user defined video security zone atop the bridge. The bridge control system raises and lowers the bridge by means of controlling all discrete devices and commands motor operations using Variable Frequency Drive (VFD). A permissive function, whereby the bridge cannot be raised unless permission is granted from the signaling department, is included. Video monitors all river traffic to, from and under the bridge and to visually verify bridge conditions before and during lift or lowering operations. In addition, the system transmits audio data to the RCT for determining river traffic and other audio events. A marine grade radar system detects boat traffic. Seismographic sensors provide bridge impact detection. Events are automatically digitally recorded, time stamped, and stored for later retrieval. A powerful video search engine (searched by several criteria including, time, date, camera number, and location) allows for easy retrieval of stored video files.

Upon perimeter breach, strobe lights flash and a multi-language audio annunciation demands that the intruder immediately leave the restricted area. Alarms and live video are broadcast simultaneously to remote monitoring stations. Railroad police are enabled to speak over the amplifier in real time (utilizing Voice Over IP via the data highway) to address the subject of the perimeter violation.

BENEFIT

This Bridge Security system provides automatic state-of-the-art bridge control and limits vulnerability including but not limited to suspicious persons, explosives, nuclear and hazardous materials and chemical/biological agents.

