PROJECT PROFILE

EFS Inspection of the Patroon Island Bridge

Location:
Albany, NY

MFS Project PM:
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Client Contacts:
Harry White
New York State Department of Transportation

Date:
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Situation

New York State Department of Transportation (NYSDOT) used Metal Fatigue Solution's Electrochemical Fatigue Sensor (EFS) System to inspect the Patroon Island Bridge (BIN 1092839) over the Hudson River in Albany, NY. Two inspections were completed on the Patroon Island Bridge, one in November of 2007 and one June of 2008. Eight locations on four fatigue-retrofitted details were inspected using ESI's patented Electrochemical Fatigue Sensor (EFS) system. The four retrofits were designed and installed to remediate fatigue-cracking problems at floor beam to gusset plate connections. The retrofit design included the removal of a large teardrop-shaped section of material in order to remove the cracked area and distribute the stress field at the floor beam to gusset plate connection.

During the inspection, custom sensors were installed around the unique teardrop shape. The sensors were placed around retrofits at locations where NYSDOT anticipated higher strains. The EFS inspection data was used to determine if microplasticity was occurring. Higher levels of microplasticity indicate the potential for future crack initiation and growth.

Results

A total of eight locations, two locations on each of the four retrofits, were tested with the EFS system. EFS data was collected during peak traffic flow with all lanes open. The EFS data and analysis were used to determine whether the completed retrofits were successful at preventing future fatigue initiation and growth. The data and analysis indicated that the retrofits were successful at reducing future risk for crack initiation and growth.

EFS verified efficacy of the retrofits installed at the connections.

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