



EFS Inspection – NSW, Australia

Location:

Various Locations Throughout
New South Wales, Australia

MFS Project PM:

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Client Contacts:

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New South Wales RTA

Date:

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Situation

Road and Traffic Authority used Metal Fatigue Solution's (MFS) Electrochemical Fatigue Sensor (EFS) System to inspect various fatigue cracks and fatigue susceptible locations in three bridges in New South Wales, Australia. The bridges were: Bridge No. 1832 (Dennis Bridge) located in Port Macquarie, Bridge No. 1852 (Kempsey Bridge) located in Kempsey, and Bridge No. 1873 (Macksville Bridge) located in Macksville. A total of 16 locations were inspected on the three bridges in January 2009.



The EFS system was installed at areas where documented fatigue cracks were previously identified and at locations that had fatigue-sensitive details similar to those that had previously documented fatigue cracks, both repaired and not repaired. The EFS data and analysis software were used to determine whether existing cracks were actively growing, whether the retrofits were successful at arresting fatigue crack propagation, and whether similar fatigue susceptible details exhibited behavior indicative of current or future crack growth activity.

Results

The EFS system was used to inspect a total of sixteen locations across the three bridges. Of these sixteen locations inspected, under the traffic conditions present during inspection, eight of the sixteen locations were found to have actively growing cracks.

Tests at various locations have determined:

- Cracks excluded from prior repair efforts were actively progressing.
- There exist locations with growing cracks where no crack is visible.
- Previously implemented repair methodologies appear to not be effective at halting crack growth.

Specifically, all of the visible cracks were found to be actively growing cracks that hadn't been previously repaired. At two of the ten locations without visually detectable cracks, it was determined that growing cracks did, in fact, exist. Further, both of the locations that had been repaired had cracks that continued to grow despite the repair, or was experiencing microplasticity and will initiate a crack in the future.

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