

Summary of significant S&T Achievements (DST/TSG/STS/2006/76) of a DST sponsored jointly undertaken by two CSIR laboratories i.e. CSIR-CRRI, New Delhi and CSIR-CMERI-CoEFM, Ludhiana entitled “**Development of one Prototype of Mobile Bridge Inspection Unit**“.The technology has successfully been developed and is under stage of transfer to Indian industry.

The objective of the project was to develop the technology for designing the vehicle mounted mobile bridge inspection unit (MBIU) and preparing its one prototype. The *MBIU* is a mechanical device mounted on a truck which has been developed jointly by CSIR-CRRI and (CSIR-CMERI) CoEFM, Ludhiana with partial grants from DST. The *MBIU* is ‘developed to cater the need of carrying out close inspection and repair work of the three lane bridge components’ below the deck. A copyright vide No. 011CR2012, dated 30.8.2012 and a patent NO. 2984/DEL/2012, dated 25th Sept 2012 has been filed. The working prototype is being used by CSIR-CRRI, New Delhi for its R&D activities and will also be made available to other Infrastructure owners for use during inspection. It has potential for export to other countries too. The process of technology transfer to industry for realizing full benefits to the society has been initiated and soon the multiple units will be available in country.



The MBIU under operation on a bridge

The major activities of the development of the MBIU were a) Designing as a structure, designing and detailing the mechanical joints, b) fabricating the frame and the joints, c) Procuring a mounting vehicle and its modification for the suspension system including the chassis, d) testing of various components and Fitting of the frames and joints on the truck, f) Installing the control sub-systems and integrating various components as a system, g) Demonstrating the functioning of the MBIU. The Unit is considered as a lattice frame mounted over the truck. The mounted support at the truck consists of a lowering/ lifting mechanism for the lattice frame to put in position around the bridge deck. Unfolding and folding of the unit is automatic with proper controls. High strength square or rectangular hollow sections (SHS or RHS) are used. The length of the working platform is 10 m (may be higher when a demand is there). This is the horizontal platform on which the inspection team stands to carry out the inspection. A payload comprising weight of 3 persons and equipment weight of 100 kg has been taken in the design of the Unit. The allowable stress in the material and the functional design conforms to IS and ANSI-SIA codes.

The Unit has the following mechanisms to facilitate the movement of the working platform in a particular direction or plane:

- i. The launching mechanism along with the support system which is fixed on the truck,
- ii. Vertical and translatory motion of the vertical frame (mast),
- iii. A mechanism facilitating the lower arm (working platform) to rotate in a horizontal plane for wider coverage of inspection area underneath the bridge,
- iv. The folding and providing variable length of the working platform.