

HTOA



Hydraulic
Trailer
Owners
Association

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HEAVY HAULERS

FIRST HEAVY LIFT JOURNAL OF INDIA

SKILL DEVELOPMENT LOGISTICS SECTOR



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भारत सरकार
MINISTER OF ROAD TRANSPORT,
HIGHWAYS AND SHIPPING
GOVERNMENT OF INDIA

Message

I feel pleasure in congratulating HTOA for its seamless efforts to promote transparency in road movement of over dimensional / over weight consignments and make Government understand the infra-structural requirements in a logical manner.

HTOA's regular publication "Heavy Haulers" has added a feather to their efforts and help stakeholders understand and feel the changing scenario in ODC movements.

It is good to share that Indian Bridge Management System is now a reality and Ministry will be very soon handling single largest database of nearly 1.4 million bridges on National Highways across India under a single web portal.

IBMS will give clear picture of Bridge location, health & other parameters in an organised manner.

I wish HTOA all success in future and expect that it will continue regular interaction with Ministry for overcoming hurdles, if any in OD/OWC movements in India and also promote transparency through wide circulation of Government Policies through HEAVY HAULERS.

(Nitin Gadkari)

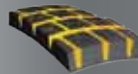


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Message

It gives me immense pleasure to see the efforts being by Hydraulic trailers Owners Association (HTOA) for raising Heavy Engineering Industries concern about over dimensional / overweight consignments road transportation in India, the bottlenecks faced and there by finding a long term legal solution to the issue. Far and wide circulation of Government policies and data through the regular publication of HEAVY HAULERS is considerable.

ISGEC Heavy Engineering limited company conveys it's thanks to the Ministry of Road, Transport & Highways for the overwhelming support to work out & implement fair & transparent policies for OD/OWC movement.

I also congratulate Hydraulic Trailers Owners Association (HTOA) team for inclusion of hydraulic modular axles in CMVR which will reduce the constant harassment on State & National Highways experienced by our logistics service providers.

I feel good to state that our concerns on ODC movement now seem to be addressed to a great extent and we in the past months have experienced a complete turn around in OD/OW equipment movement from our various manufacturing facilities/project sites spread across the nation. After a long time ISGEC has now been able to deliver its products within the scheduled time.

I wish entire Hydraulic Trailers Owners Association (HTOA) team grand success in the days to come and also look forward to much more improvement through sharing of concerns by your strong publication media in the form of HEAVY HAULERS on regular basis.

Wish You 'Har Maidan Fateh'

Col K. S. Rana

Vice President (HR & Admin.)

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SPECIAL INVITEE

From the Desk of CHAIRMAN



Bharat C Gandhi
Chairman
Hydraulic Trailer Owners Association

D

ear friends,

I take this opportunity to convey thanks for reposing faith in me and giving me responsibility to lead HTOA.

During the past two years in capacity of Vice Chairman I had an opportunity to work in close co-ordination with Mr. Manish Kataria, who has been actively involved with HTOA since its inception. It was a good learning and HTOA team under his able leadership was able to achieve many mile stones.

Key achievements were:

- a) Amendment to central Motor Vehicle Rules, 1989 for inclusion of Puller Tractor & Modular Hydraulic Trailers in the type of vehicles.
- b) Notification for Gross Vehicle Weight for Puller Tractor as 36 metric tons and Modular Hydraulic Trailer as 18 metric tons/axle row.
- c) Transparent online permission system for movement of Over Dimensional / Over Weight Consignment over modular hydraulic trailer. The same has lead

to grant of more than 6000 permissions in nearly two years with a revenue to exchequer amounting app. Rs.12 crores by our members spread across the length & breadth of Nation.

- d) Inclusion of HT-9 loading arrangement with 385 metric tons Gross Combination Weight in IRC:6 code for design of new bridges.

Above milestone could not have been achieved without the overwhelming support from Ministry of Road Transport and Highways, Government of India under the strong leadership of Shri. Nitin Jairam Gadkari, Union Minister of Road, Transport, Highways & Shipping.

The radical change in movement of ODC/OWC in India was made public by HTOA in shape of a brief FILM which was released for public viewing by Hon'ble Minister Shri. Nitin Jairam Gadkari at Parivahan Bhawan, New Delhi. The same was also put on public domain www.morth.nic.in under title **"Redefining Infra Logistics"**.

The concentrated efforts of Ministry & HTOA has gone long way in understanding infrastructural demands in our Country with respect to movement of mega project



equipments, which can be visualized with the launch of **“Indian Bridge Management System”** at New Delhi by Hon'ble Minister Shri. Nitin Jairam Gadkari on October 4, 2016 on the occasion of First Biennial conference of IBMS.

HTOA with its sole motto to promote transparency and smooth movement of over dimensional / over weight consignments will leave no stone unturned in the days to come.

I am sure with the support from all of you, we can make transportation on modular hydraulic trailers hassle free and corruption free across the Nation.

JAI HIND

Bharat C Gandhi
Chairman-HTOA



अध्यक्ष की कलम से



भरत सी गाँधी

अध्यक्ष

हाइड्रोलिक ट्रेलर ओनर्स एसोसिएशन

प्रि

य मित्रों,

मैं आप सबका मेरे प्रति विश्वास और एचटीओए (HTOA) का नेतृत्व करने की जिम्मेदारी देने के लिए धन्यवाद व्यक्त करता हूँ।

पिछले दो वर्षों के दौरान वाइस चेयरमैन की हैसियत से मुझे श्री मनीष कटारिया, जो एचटीओए के स्थापना के बाद से सक्रिय रूप से शामिल है, के साथ घनिष्ठ समन्वय में काम करने का अवसर मिला। यह एक अच्छा सीखने का अवसर था और उनके कुशल नेतृत्व में मैं एचटीओए टीम में कई मील पत्थर प्राप्त करने में सक्षम हुआ।

मुख्य उपलब्धियां :

- क) पुलर ट्रैक्टर और मॉड्यूलर हाइड्रोलिक ट्रेलर प्रकार के वाहनों को केंद्रीय मोटर वाहन नियम, 1989 में शामिल किए जाने के लिए संशोधन।
- ख) 36 मीट्रिक टन के रूप में पुलर ट्रैक्टर और 18 मीट्रिक टन / धुरा पंक्ति के रूप में मॉड्यूलर हाइड्रोलिक ट्रेलर के लिए सकल वाहन वजन के लिए अधिसूचना।
- ग) मॉड्यूलर हाइड्रोलिक ट्रेलर पर ओवर आयामी / अधिक वजन वाले माल की आवाजाही के लिए पारदर्शी ऑनलाइन अनुमति प्रणाली। इसके कारण लगभग दो साल में 6000

से अधिक अनुमतियां मिली तथा देश में नियुक्त हमारे सदस्यों द्वारा 12 करोड़ की राशि सरकारी खजाने में राजस्व के रूप में जमा कराई गयी।

घ) नए पुलों के डिजाइन के लिए आईआरसी 6 कोड में 385 मीट्रिक टन सकल संयोजन भार के साथ एचटी-9 लोडिंग व्यवस्था का समावेश।

उपरोक्त उपलब्धियां केंद्रीय मंत्री, सड़क एवं परिवहन, राजमार्ग और नौवाहन, माननीय श्री नितिन जयराम गडकरी के मजबूत नेतृत्व में सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार के ओर से भारी समर्थन के बिना हासिल नहीं की जा सकती थी।

भारत में ओडीसी/ओडब्ल्यूसी के आंदोलन में क्रांतिकारी परिवर्तन एचटीओए के द्वारा एक संक्षिप्त फिल्म के माध्यम से जनता के लिए सार्वजनिक किये गए थे और इस फिल्म को माननीय मंत्री श्री नितिन जयराम गडकरी द्वारा परिवहन भवन, नई दिल्ली से जारी किया गया था तथा इसे सार्वजनिक डोमेन www.morth.nic.in पर "रिडिफायनिंग इंपरा लोजिस्टिक्स" शीर्षक के तहत रखा गया था।

मंत्रालय और एचटीओए के केंद्रित प्रयासों को बड़ी परियोजना उपकरणों के आंदोलन के संबंध में हमारे देश में ढांचागत मांग को समझने में लंबी दूरी तय की है, जो कि नई दिल्ली में



4 अक्टूबर, 2016 को आईबीएमएस (IBMS) के प्रथम द्विवार्षिक सम्मेलन के अवसर पर माननीय मंत्री श्री नितिन जयराम गडकरी द्वारा “भारतीय ब्रिज प्रबंधन प्रणाली” के प्रक्षेपण के साथ देखे जा सकते हैं।

आने वाले दिनों में एचटीओए अपने एकमात्र आदर्श वाक्य के साथ पारदर्शिता और अधिक आयामी / अधिक वजन वाली खेप की आवाजाही को बढ़ावा देने के लिए कोई कसर नहीं छोड़ेगी।

मुझे विश्वास है कि आप सभी के समर्थन के द्वारा हम राष्ट्र भर में मॉड्यूलर हाइड्रोलिक ट्रेलरों पर परिवहन को परेशानी मुक्त और भ्रष्टाचार मुक्त बना सकते हैं।

जय हिन्द

भरत सी गाँधी
अध्यक्ष, एचटीओए



HTOA Meetings During August-November, 2016

Date	Dignitaries	HTOA Officials Present	Issues Discussed	Venue
09.08.2016	Mr. Nitin Gadkari Union Minister of Road Transport & Highways and Shipping Government of India	Mr. Manish Kataria Mr. Bharat Gandhi Mr. Ram Ratan Agarwal Mr. Zarksis Parabia Mr. Pradeep Bansal	Release of HTOA MORTH Film	Transport Bhavan, New Delhi
01.09.2016	Shri. Sudhir Shrivastava Addl. Chief Secretary, Department of Transport Govt. of Maharashtra	Mr. Bharat Gandhi	Representation on overloading in articulated Trailers	Mantralaya, Mumbai
02.09.2016	Shri. Pravin Gedam, Transport Commissioner Department of Transport Govt. of Maharashtra	Mr. Bharat Gandhi	Representation on overloading in articulated Trailers	TC Office, Bandra (East).
10.09.2016	9th Annual General Meeting Election of the Office Bearers	All office bearers & members with distinguished Guests Mr. J.P. Martin Goldhofer, Germany Mr. R. Narayan Election officer All Members	Activities in past 2 years Election of new Committee	The Leela, Sahar, Mumbai
04.10.2016	Mr. Sachin Joshi, Team Leader of IBMS Mr. S.N. Das, DGRD & SS, MoRTH Mr. R.K. Singh, ADG, MoRTH Mr. V.L. Patankar, Director-IAHE, Noida Mr. A.K. Pandey, SE - MORTH Mr. Alok Bhomick, Bridge Engineer	Mr. Manish Kataria Mr. Bharat Gandhi Mr. Jignesh Patel	Attending Biennial Conference of IBMS	NDMC Convention Centre Sansad Marg, New Delhi.
04.10.2016	Mr. B.K. Sinha Chief Engineer (B) S & R Mr. S. Wathore, SE, MoRTH	Mr. Manish Kataria Mr. Bharat Gandhi Mr. Jignesh Patel	To Discuss the overloading done in Mechanical Trailers which are responsible for extensive damage to bridges.	Parivahan Bhawan, New Delhi
05.10.2016	Shri. Nitin Gadkari, Union Minister-MoRTH Shri. Suresh Prabhu, Union Minister of Railways Mr. B.K. Sinha, CE-Bridges, MoRTH Mr. Wathore, SE-Bridges, MoRTH	Mr. Manish Kataria Mr. Bharat C. Gandhi	Representation on online permission system for ODC passage at electrified Railway Crossing accross INDIA	4th floor Conference Hall, Parivahan Bhawan, New Delhi.
21.10.2016	Mr. Abhay Damle Joint Secretary-Transport, MoRTH Mrs. Rashmi Urdhwarshe, Director-ARAI, Pune Mr. Badushah, ARAI, Pune	Mr. Bharat Gandhi Mr. Madanlal Sharma Mr. Sharad Bhatt	Representation on the new amendment issued by MORTH for passing of 36 MT RLW for New Puller Tractor to be made applicable for existing fleet of Puller Tractors	ARAI Head Quarters, PUNE

<p>17.11.2016</p>	<p>Mr. B.K. Sinha, CE-MoRTH</p> <p>Mr. S. Wathore, SE-MoRTH</p> <p>Mr. A.K. Bansal, ED-Bridges, Ministry of Railways</p> <p>Mr. Sudhir Garg, ED-EEM, Ministry of Railways</p> <p>Mr. S.K. Sharma, ED-Rates, Ministry of Railways</p> <p>Mr. Mansoor ul Haque, NIC-MORTH</p>	<p>Mr. Bharat Gandhi Mr. Manish Kataria Mr. Pradeep Bansal Mr. Rajkumar Agarwal Mr. Zarkis Parabia</p>	<p>Joint meeting with MoRTH & Ministry of Railways to discuss on online Permission for passage of ODC at Electrified Railway Level Crossing.</p>	<p>Parivahan Bhawan & Rail Bhawan, New Delhi</p>
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By Marco J van Daal
Lecturer/Author/Speaker

TRAINING & SKILL DEVELOPMENT

In the recent months our industry has been shocked once again with (deadly) crane and transport accidents. Although we may never find out the real reason behind some accidents, there is one reason that causes the majority of accidents in our industry; communication. It is a buzz word nowadays and many believe that if it is repeated often enough, communication will somehow improve. Fact however is that to improve communication and reduce accidents, a solid plan is required that is implemented at the top level of an organization and that needs to trickle down to every level below. Before we get into the details, let's look at some numbers and reasons behind why accidents happen. For the last 10 years or so I have collected all the information I could get on every crane and transport accident. This has resulted in the following overview, see Figure 1.

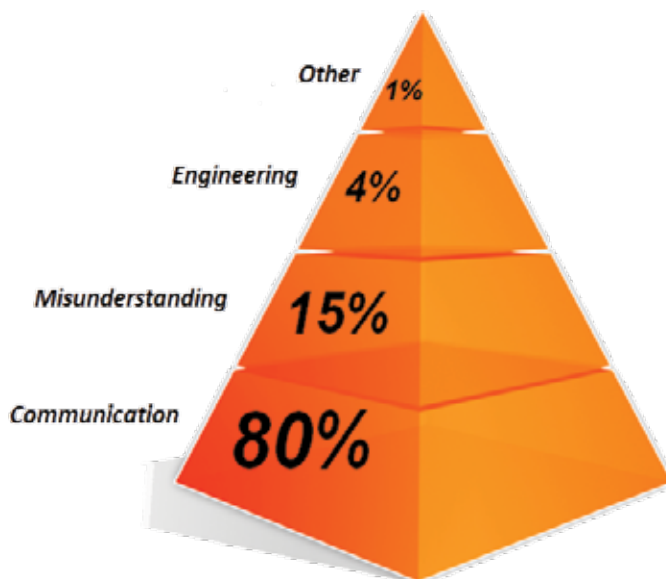


Figure 1

Communication (or lack thereof) is the cause of 80% of all accidents in our industry. It covers a wide range of issues that are all related to communication. Varying from team members simply not talking to each other or the sales department failing to inform the operations department about the exact scope of work, once they arrive on the job site. But also unclear responsibilities and associated authorizations appear to be high on the list of uncertainties. Last but not least, terminology and disagreements in hand signals contribute to the high number of communication related mishaps. The sad truth is that most, if not all, of these mishaps are avoidable by relatively simple procedures such as department, client and tool box meetings. Checklists are another tool that can help in avoiding to forget activities. Crew Resource Management or CRM (more on this later in this article) has been found a most effective method to improve on communication and reduce mishaps.

Misunderstanding covers exactly what the word implies; a misunderstanding of a part of the operation or equipment or concept. Examples here are not knowing what a Center of Gravity is, or what it does if it is underestimated or neglected. Not knowing the principle working of a hydraulic transporter or a crane also falls in this category. Over the years I have been really surprised a few times how leading individuals that worked in our industry for decades lacked the knowledge of basic transport and lifting principles. Mishaps caused by misunderstanding can be reduced by proper training of personnel. In my seminars, work shops and master classes I teach these principles and concepts to every layer of an organization, management, maintenance, operations, sales etc. I also teach how these departments can improve their efficiency by working together as opposed to operating stand alone. Unfortunately over half of my classes take place after an accident has already happened.

Engineering mishaps are (fortunately) on the reason of only 4% of mishaps. I have seen only two main reasons here. The engineer in question is inexperienced in this field. A qualified engineer is not necessarily a qualified rigging engineer. The second reason lies in the conversion of units, from ton to kilogram to LBS to kips to short tons to long tons etc. Somewhere along the line a simple mistake was made and by definition the outcome of the engineering is incorrect. A second opinion or engineering review could bring these mistakes to light.

Other is a collection of “everything else” that can go wrong on a job. This covers personal situation at home, fatigue, friction between team members, obnoxious supervisors or project managers etc. This is the category that is most difficult to manage, it is officially non-existing as nobody wants to bring it up. Our industry is generally not one of employee complaints or nagging.

Crew Resource Management (CRM).

CRM is a training initially developed by NASA (See Figure 2) following the 1970 Apollo 13 incident (Houston, we have a problem). The investigation that took more than 5 years revealed that the most accidents resulted from one source; human error caused by improper communication. No surprise here.



Figure 2

Crew Resource Management works in three easy steps;

- 1 get rid of the military regime (I am the boss/supervisor/manager, you do as I tell you)
- 2 adopt the assertive statement process (no more loose remarks such as “that spreader bar looks small”)

- 3 assign a central or single point of contact (this can be the boss/supervisor/manager but in a different capacity as before)

Step 1 and 3 are relatively easy to implement but how does step 2 work. Step 2 consists of a process that can be divided in 5 steps, each step is of equal importance but in some cases multiple steps can be combined.

- A “hey chief”, “boss” or just “Harry”
The attention is called
- B “the load is leaning”
The concern is raised
- C “our limit is 8 deg, we must be close to it”
The problem is stated
- D “let’s raise the front end left corner (Alpha)”
A solution is proposed
- E “what do you think, Harry”
A response is forced

The difference between the CRM method and just stating that “the load is leaning” or “that spreader bar looks small” is that the CRM method forces the one who calls the attention to think about his concern and at the same time the CRM method forces a response from the one whose attention is called.

So what if I see the that the load is leaning but I don’t know the limit nor do I know what to do about it. Should I say nothing because I have no proposed solution. In a properly implemented CRM method, any concern is raised if a team member feels uncomfortable about something. The following steps are perfectly acceptable as the outcome is that the situation is reviewed when the concern is raised.

- A “hey Harry”
The attention is called
- B “the load is leaning.... a lot”
The concern and problem is raised
- C “let’s stop and see what is going on”
A solution is proposed
- D “what do you think, Harry”
A response is forced

You can imagine that in critical situations it is not always possible (for example due to time constraints) to follow to 5 or even 4 steps. The following conversation is still within the CRM guidelines;

- A "Harry, the load is leaning, we need to stop and fix this"
The attention is called
The concern, problem is raised
A solution is proposed
- B "alright Harry?"
A response is forced

As you can see, it is not a scientific method that requires a high degree of education. It is merely a systematic approach to arrive at a solution, every time. Even in cases where there is no solution, at least the concern was raised and the problem was stated and now you can come to a safe conclusion that there is no solution at hand, and you may have to get help or change something in your game plan.

The simplicity and effectiveness of CRM reached other industries such as the airline industry. In 1981 United Airlines was the first airline to implement CRM (now with the applicable name of Cockpit Resource Management) in their training program and by 1990 it had become a global standard.

Crew Resource Management is a standard topic in my trainings and seminars.

The practical side of training

I founded my company, The Works international, in 2006 based on a wide and international experience in Heavy Transport, Heavy Lift, project preparation and execution, engineering and management. In the standard 2-day seminar I share with the audience the knowledge that was gained in a period of over 20 years, in over 55 countries (India included) on 5 continents. They are not the average "sit-and-listen" seminar but highly interactive events where dialogues take place and questions are asked (and answered). The various sessions are based on slide shows with many images and videos of actually executed projects. This gives a thru and realistic impression to the audience.

The interactive nature teaches every level of an organization to assess a project and detect potential disasters in the early stages and prevent them from happening. The following chapters are on the agenda;

- 1 introduction and terminology
- 2 heavy transport

- 3 heavy lifting
- 4 jacking & skidding
- 5 load-outs (ro-ro)
- 6 accidents and how to avoid them (includes the CRM module)
- 7 maintenance & inspection

I offer 3 different levels of training, they all cover the same topics but in various degree of details and depth.

Bootcamp

The bootcamp training is targeted for individuals that are required to work with and around Heavy Lift and Transport projects but are not deeply involved in the engineering and execution. Experience learns that freight forwarders are much interested in this training. The bootcamp gives them the knowledge to ask the right questions and understand the various phases of a project that involves Heavy Lift, Heavy Transport and Project Cargo but without going into much engineering and calculations.

Seminar

The seminar is suited for (heavy) lift & transport companies, refineries, fabrication yards etc. Companies and individuals that are on the executing end or overseeing the executing end in details. The seminar gives the various layers in their organization the skills to think in the same direction and along the same lines, herewith creating efficiency and preventing mishaps. All lifting and transport equipment available on today's market is explained in great detail, highlighting the possibilities and limitations of each. Many case studies form a part of the seminar.

Master Class

The MasterClass is almost exclusively for companies and individuals that are responsible for calculations and justifications. Based on the attendance it is safe to say that engineers, engineering companies and insurance companies form the largest audience. The main difference between the Seminar and the MasterClass is that the MasterClass takes it a step further and not only solves the case studies but also highlights why one solution is better than another one, supported by a good foundation.

See Figure 3 showing a seminar in progress in 2015 in Mumbai, India.


Bio.

Marco J. van Daal has been in the heavy lift & transport industry since 1993 starting with Mammoet Transport from the Netherlands and later with Fagioli PSC from Italy, both esteemed companies and leading authorities in the industry. His 20 year plus experience extends to 5 continents and over 55 countries and has resulted in a best selling book "The Art of Heavy Transport" which is available at www.the-works-int.com. Marco has a real passion for sharing knowledge and experience, the prime reason




for his frequently held seminars all over the world. He currently resides in Aruba, Dutch Caribbean, with his wife and two daughters.


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Marco J. van Daal
lecturer | speaker | author

SGRA | UBM | ASME



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- injuries
- insurance increase
- loss of contracts

Achieve

- increase in knowledge
- better communication
- crew piece of mind
- better risk assessment
- improved EMR rating

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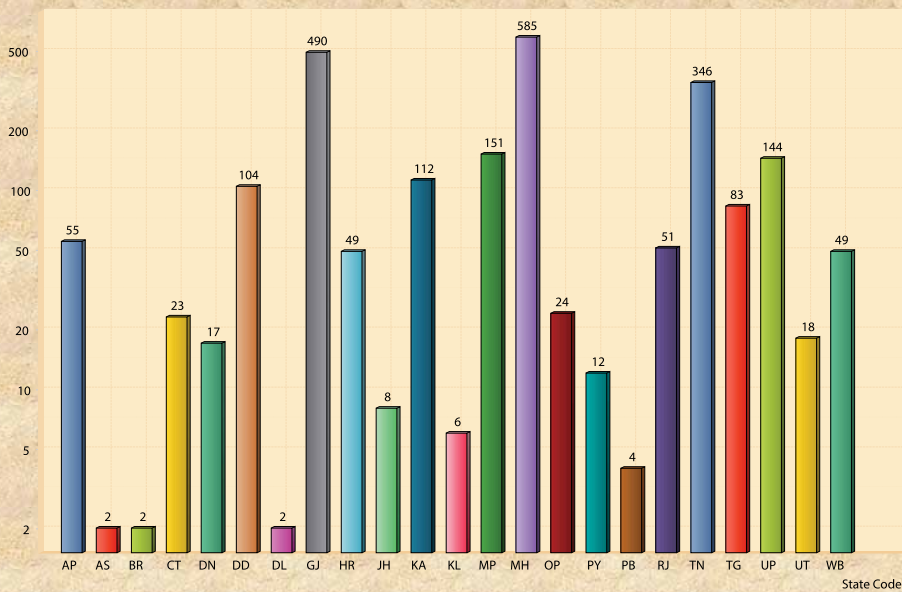


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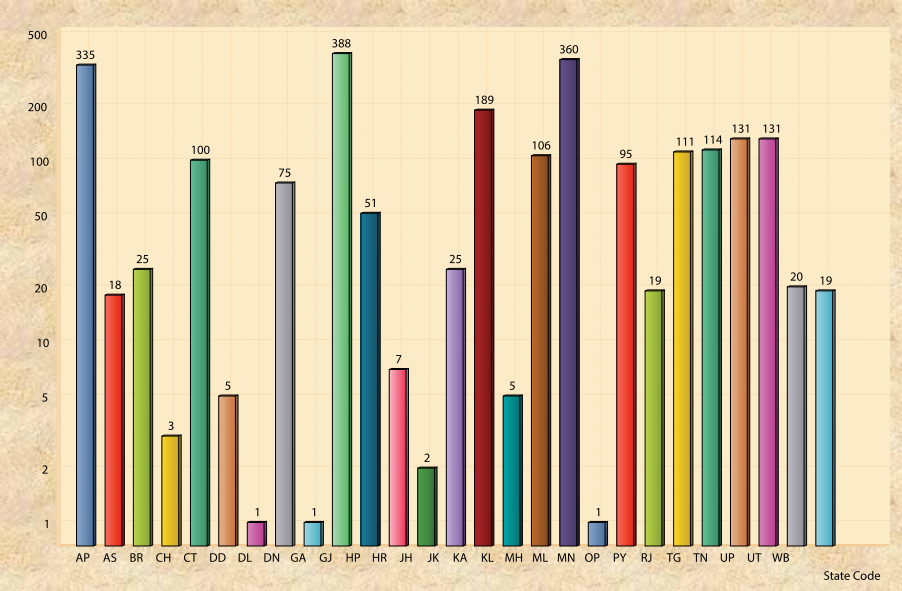
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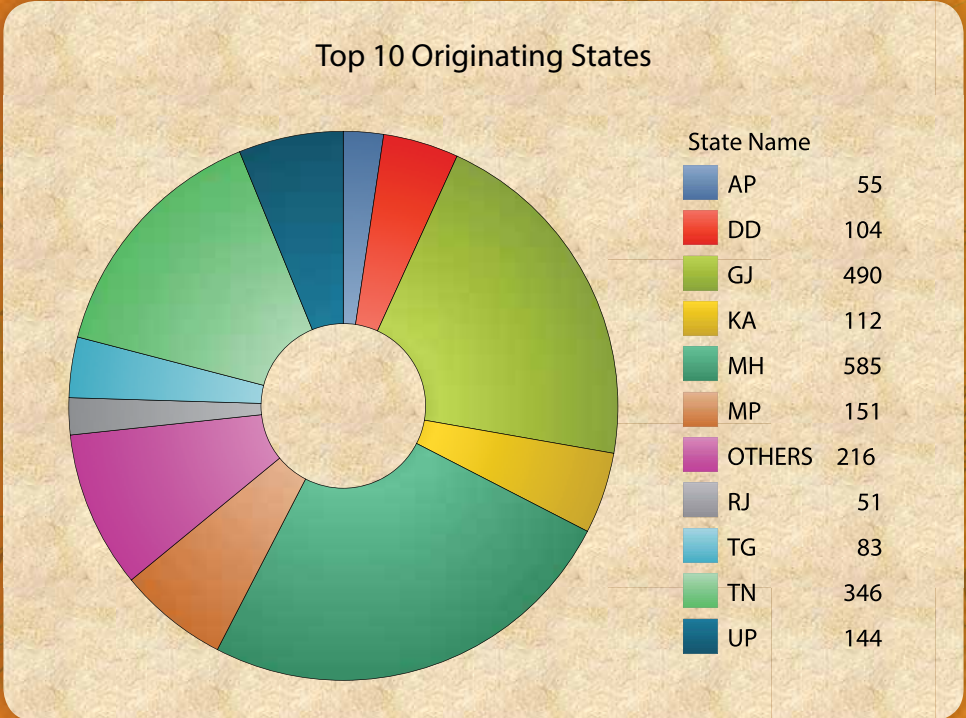
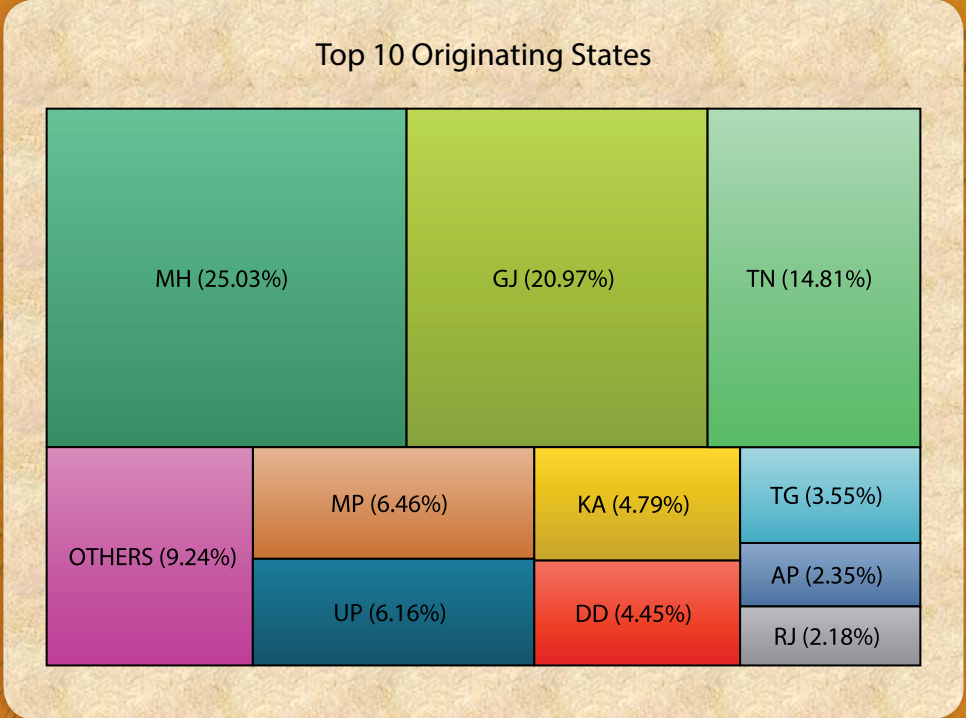
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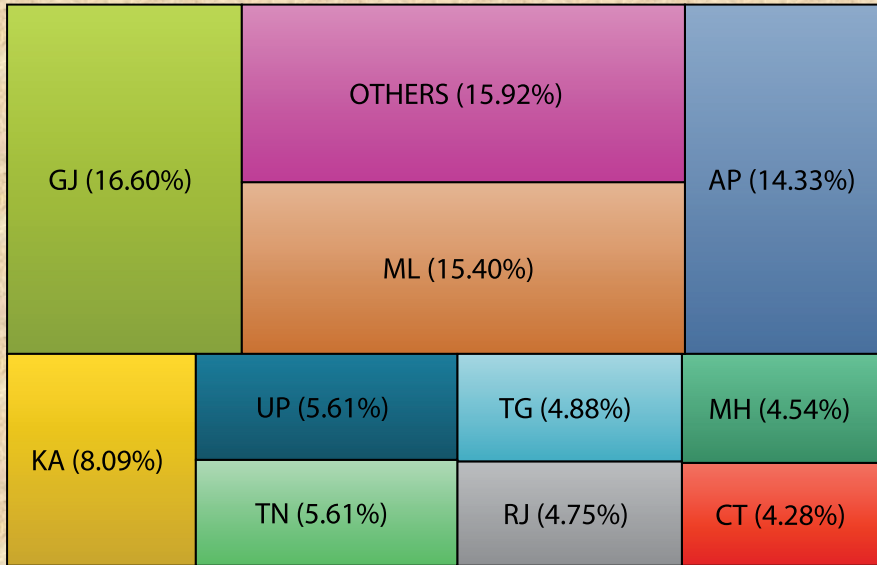


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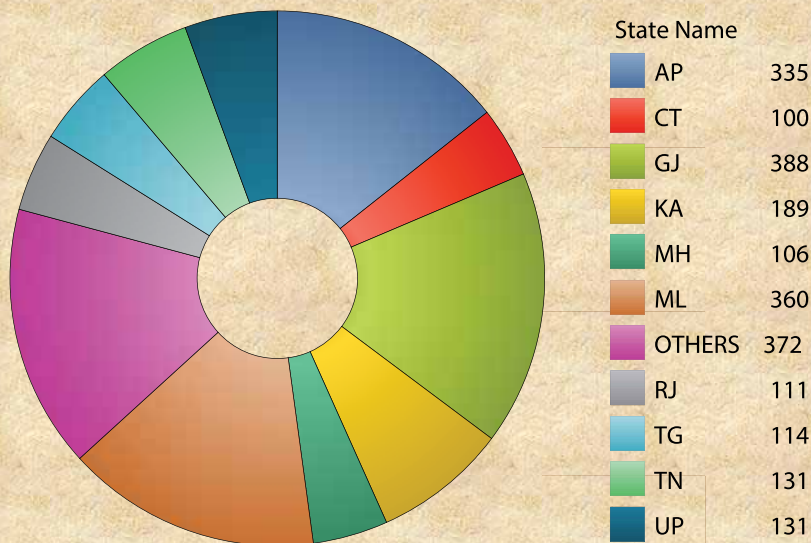
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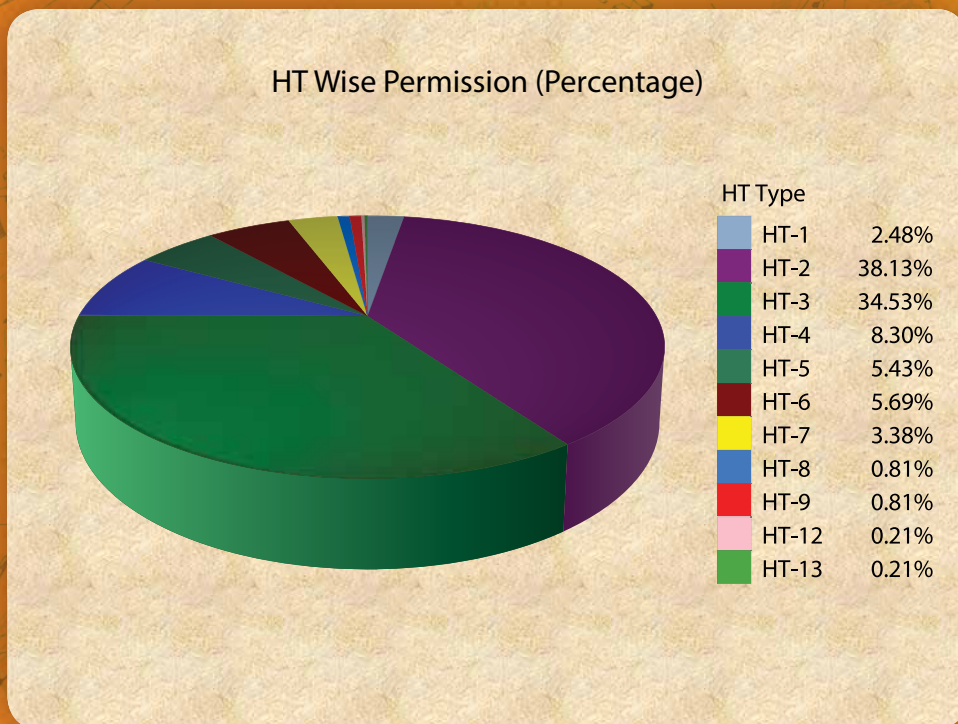
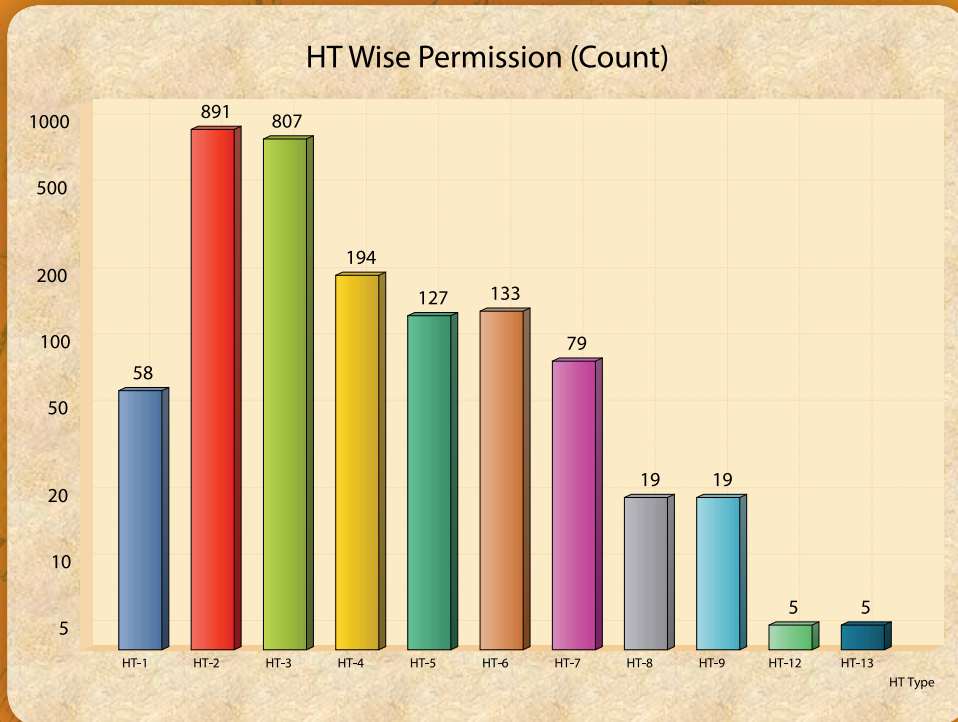
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BARGE INSTABILITY WAS KEY TO THE ALPHEN DISASTER



Richard L. Krabbendam
Heavy Lift Specialist

Crane Safety Professionals will find the Dutch “Nationaal Baggermuseum” (National Dredging Museum) in the town of Sliedrecht, home of the Dutch Dredging Industry of interest. As this museum gives a great overview of history regarding the battle of the Dutch against its ever-present enemy the Sea.

The core of the permanent exhibition consists of historical and modern scale models of dredging ships and equipment. One of the important displays on show is a model, which demonstrates what the stability or rather the Instability of a floating object means. Had the operators of the Alphen Crane Disaster, which occurred on the 3rd of August 2015 visited this museum, they may have had a better idea, what they were doing.

Stability of a barge

When a load is lifted by a tripod gantry as shown in Fig.1 and 2, it is as if the load is positioned in the top of the tripod. The combined CoG of barge (barge weight =300 tons; load =100 tons) and load can be calculated with the moment equation as shown. The same situation applies to a crane, when positioned on a barge and lifting a load with a long Telescopic boom. The Alphen incident clearly failed on a detailed Stability calculation and risk assessment analysis. The result being that the barge on which the Liebherr LTM1400 was positioned while lifting a load of 97.8 Tons had insufficient stability

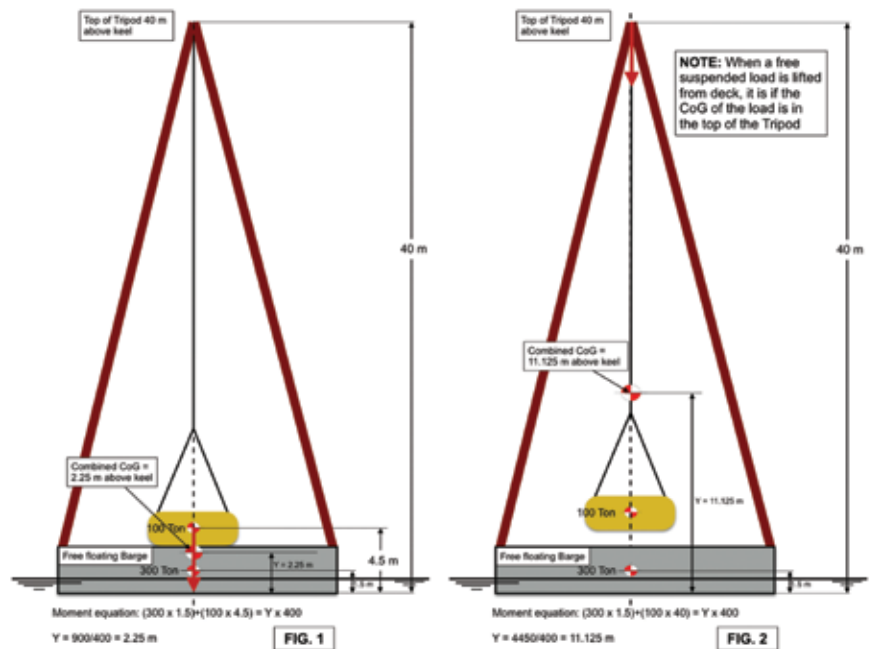


FIG.1+2 When lifting a freely suspended load from deck of a barge, it is as if the CoG of the Load is in the top of the tripod gantry



FIG.3 Due to insufficient Stability of the barge, the list increased and main boom of the Liebherr collapsed

and started listing until the forces on the boom of the crane caused the boom to collapse and pulled the crane over. See Fig.3. The incident was investigated by the Dutch Safety Board and on the 29th of June 2016, the excellent official investigation report was published.

Description of the project

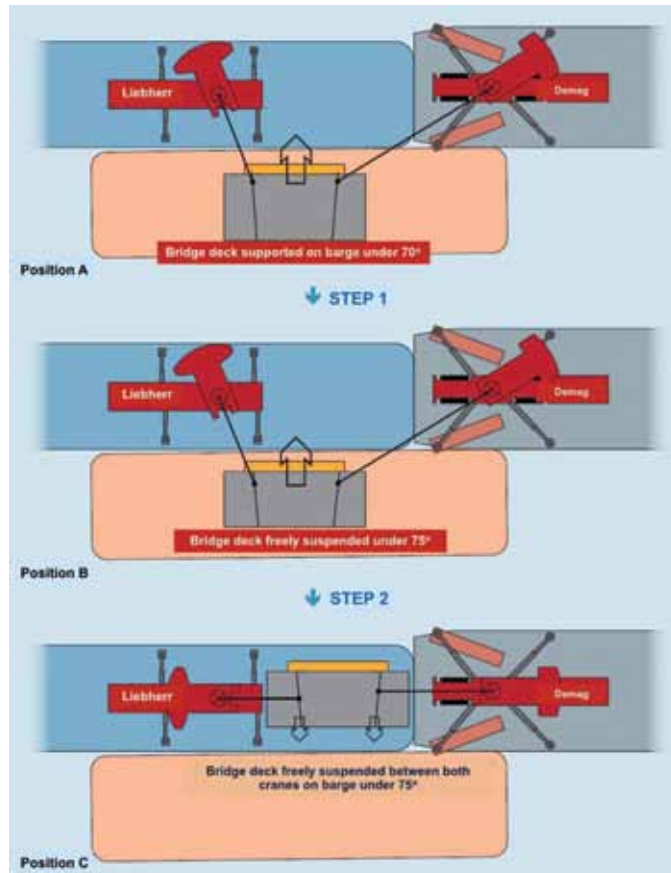


FIG.4 Schematic overview of the planned lift operation

The project involved the transportation and installation of a bridge deck with a length and width of approx. 22 x15 m and a weight of 187 tons. It was transported at an angle of 70° placed on a steel supporting structure placed on a separate transportation barge (See FIG.4+5 Position A). The plan was to lift the bridge deck with two mobile cranes (a 400 Tons Liebherr LTM1400 and a 700 Tons Demag AC700) placed on two barges and slew the bridge deck in between both cranes and then tow the barge combination over 100 meters to the bridge abutments and install it. During the lifting operation with both

cranes working in tandem, it went horribly wrong and the barge with the Liebherr crane toppled and the falling bridge deck then kicked one of the Demag outrigger supports over the barge edge and toppled as well. (see FIG.3) Fortunately nobody was injured.

Limited working space

Due to the limited working space as well as the strength of the bridge abutments, the bridge deck could not be installed by mobile cranes positioned near the bridge itself and therefore it was decided to use two barges with two telescopic mobile cranes positioned on deck. A basic liftplan as well as stability calculation were prepared, but these plans failed in the details and the all important lifting and stability rules were not adhered to.

Max. Lift Capacity

Although a tandem lift was planned, the Demag AC700 (boom length 45.5 m) was utilized up to 98.7% of its max. capacity, while the Liebherr LTM1400 (boom length 36 m) was used up to 99.9% of max. capacity. One of the basic rules for lifting with mobile cranes is that both cranes are positioned horizontally on stable and firm underground. A rule of thumb for executing tandem lifts is, to always have sufficient safety margin for error by not going over 75% of the rated lift capacity as per load chart. This was not done and both cranes were utilized to almost 100% and in some cases even above their rated lift capacity. To enable the cranes to keep working, the Load Moment Indicator (LMI) was over ruled. During the lifting operation, the wind speed was between Beaufort 2-4 from the South going to direction West, which was almost perpendicular to the bridge deck surface. Estimated wind speed during the incident was approx. 7 m/sec.



FIG.5 The Liebherr LTM1400 and Demag AC700 just before the incident

Barge stability

Although a barge stability calculation was made and showed a GM of approx. 2.7 m, this was during the course of the project not updated, while additional weights (approx. 40 Tons) were placed on deck of the barge and influenced the stability in a negative way. Due to the deflection of the crane boom, the barge stability GM value was further reduced with approx. 1 m, resulting in insufficient stability of the barge, causing the toppling. The plan was to start slowly lifting the bridge deck with both cranes and then keep both barges leveled during this operation by pumping ballast water in the ballast tanks. However as soon as the bridge deck was freely suspended from the cranes hoist tackles, the barge stability decreased significantly causing the Liebherr crane to list so much that the side forces on the boom caused the boom to collapse, resulting in the bridge deck falling down and pulling the Liebherr with it, while kicking the right rear outrigger of the Demag crane over the edge of the barge as well. Had the bridge deck been secured in tackles (as shown in FIG.7 with blue lines), avoiding its movement in horizontally, they maybe could have avoided the toppling, then the stability of the barge would have been a lot better, as the combined CoG of barge and load would then have stayed where it was and not as high as in FIG.6. See FIG. 6+7.

Conclusion

None of the parties involved in the project had any awareness of the risks for the residents living in the direct vicinity of the lifting operation. The Risk Analysis made, was inadequate and did not address the risks of toppling cranes. The root cause of the incident was in the preparation and engineering phase of the project. The Crane rental company as well as the barge owner had greatly under estimated the complexity of the planned lifting operation and they were not properly addressing the safety risks involved. This resulted in a lift plan, which had insufficient stability. An initial GM value of 4.5 m would be required instead of a GM value of only 2.7 m. Even a flawless executed operation would not have stopped the toppling of the cranes. The lift plan did not take into account the movement of both cranes, the extra loads that were placed on deck of both barges, deflection

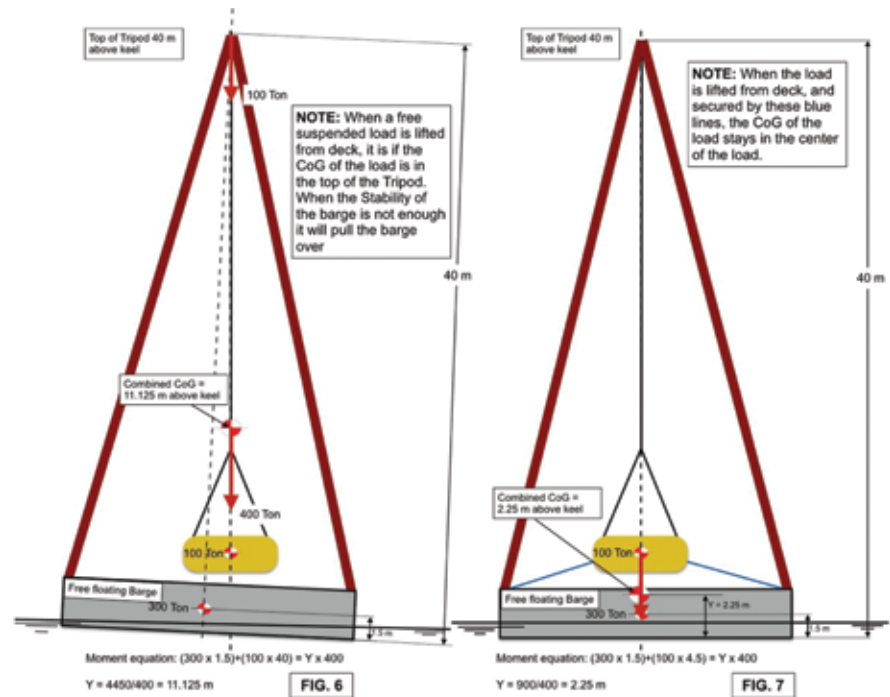


FIG.6+7 Location of combined CoG of a Free suspended load and a secured load

of the crane booms under load and wind forces. There was no margin for error as both cranes were utilized up to 100% of their rated lift capacity. A detailed ballast plan to keep both barges leveled and stable during the lifting operation was not made. All parties involved were relying on the expertise and experience of the contracted partners in the project, but did not check each other and greatly under estimated the complexity of the operation. Mobile telescopic cranes are designed to work on a leveled stable ground surface and only allow 0.1o offset for the Demag AC700 and 0.3o offset from horizontal for the Liebherr LTM1400. This was hardly possible on free floating barges. In case mobile cranes are used on floating barges, the rated lift capacity should be derated as per manufacturers guidelines. This was not done. A detailed 7 minutes explanation of the incident can be viewed in a YouTube video on: https://www.youtube.com/watch?v=LJevke4_i5Y.

It is good to see that a detailed report, which was prepared by the Dutch Safety board was published, as we all can learn from the mistakes that were made here. Sources: Report of the Dutch Safety Board and Orca Offshore <https://onderzoeksraad.nl/nl/onderzoek/2142/hijsongeval-alphen-aan-den-rijn>



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7 INSURANCE POLICIES, A MUST FOR EVERY TRANSPORT CONTRACTOR



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Multimodal Movement and Road Transportation of Super Heavy Cargo, Over Dimensional Cargo and SODCs in India is not RISK FREE transportation due to various reasons such as inadequate port and road infrastructure available in India, poor road conditions during monsoon, movement of heavy lifts in hilly terrain area, congested roads, and also some times due to human error in the absence of

proper training through recognized institutions/training centres for both operations and road safety. Accidents also happen due to fault of other road users. As per media report 500000 road accidents are reported in the country and 150000 people lose their lives every year. Govt. is committed to reduce the accidents and fatality by 50% in 5 years by adapting various measures.



We have over hundred heavy lift operators in India and many are not fully aware about the financial risk they are exposed to in doing transportation business. We are paying huge Road Tax for our road transport equipments and also paying OWC fee for online MORTH ODC permission but the risk to carry the cargo on road is still with the Transporter even after obtaining formal permission online under MORTH Guidelines. ODC permission also has many

conditions. Let me share my views on how one can minimize the financial risk.

To insulate from any unforeseen liability claim for damages due to accident even when the transport contractor is not negligent on his part in performance of the contract there are certain liability insurance policies available at both public sector and private sector insurance companies and the Transporters can obtain such policies to cover their risk.



I describe all 7 types of polices one by one below :-

1. Multimodal Transport Operators Liability Policy / MTO Policy:

All transport contractors are not doing only road transportation job. They also provide multimodal transportation services like road-barge, road-barge-road, road-barge-ship-road, rail-road, road –rail – road etc and also value added services like loading, unloading, handling and temporary storage.



Few operators take only Carriers Legal Liability Insurance cover which covers only risk associated with road transportation activity. Insurance companies also provide Multimodal Transport Operators Liability Policy (MTO policy) covering more than one activity which includes Marine Transport. One can exclude liability insurance cover for the Marine transport provided the Transportation contract has specific clause for waiver of right of subrogation. When it is coastal movement either by barge or by ship clients generally do not agree to give waiver of right of subrogation since it attracts higher premium for them. If there is no waiver, risk involved is very high. It is a must for contractor to take single all risk liability insurance policy to cover both marine and road transportation.

The risk coverage in such policies are :-

- War & SR CC
- Physical loss or Damage to cargo while in care, custody & control of the insured, or a party who has contracted or sub-contracted. To provide transport services.



- Transshipment, loading & unloading & Transit storage, intermediary stores,
- Transport liability Ext. would cover physical loss or damage to property, bodily death or injury or illness to TP arising out of operation of the insured limit.
- Error & Omission liability limited to 10% of indemnity.
- Legal liability for actual physical loss of or damage to goods whilst being transported in India by vehicle / barge specified in the schedule by the insured as per contract of carriage in writing against all risk cover inclusive of war and SRCC.



Obtaining a policy is very simple and takes less than a week to process the application. Contractor needs to provide the Underwriters copy of contract, value of the cargo required to transport, route, duration, the activities involved and explain the possible risks during execution. The annual premium works out to upto 1.0% of the sum insured. There is an option to take policy for shorter duration on shipment to shipment basis if multimodal movement is not happening throughout the year.

One needs to study the transport contract/Work Order carefully and see if there are any deductibles in the Transit Insurance Policy taken for cargo by client and if deductibles going to be deducted from the contractor's bill in case of any transit damage claim, client should be asked to remove such clause from the work order as they can cover the deductibles in their policy by paying small additional premium as currently deductibles cannot be covered under transporter's MTO liability insurance policy.

2. Carriers Legal Liability Insurance Policy :

Barring few, almost all transport contractors today take this annual cover but the problem is how to arrive the correct total sum insured ? There are instances where client ask for all risk cover upto 5 Million Dollars (Depending upon nature and value of contract). Sum insured to be decided on the freight turnover and risk associated with the transport. This does not cover deductibles in Transit Insurance Policy for cargo. Insurance company / brokers

can assess the requirement in consultation with the transport contractor. This is a must policy for companies who provide only road transportation services. The premium varies from 0.30% to 1.0% and it depends upon risk profile, experience, value of consignment, type of cargo, distance involved, mode of transport route going to be followed to determine the risk involved on account of terrain, indemnity required.



In case of transit damage customer always insist for damage certificate from transporter. Transporter should not issue such certificate if cargo is not damaged during transit when the cargo is in their custody. Generally customers hold payment till damage certificate is issued and if there is no option but to issue the certificate transporter should ask for copy of survey report and also appoint their own surveyor to assess the loss and the amount of liability

which is going to come on them. Proper care needs to be taken in consultation with experts dealing with insurance matter while issuing damage certificate to avoid huge claim coming on Transporters later on.

3. Automobile Insurance Policy :

We have both Comprehensive and Non-Comprehensive cover available but it is advisable to go for Comprehensive Policy for both Hyd axles and Prime

Movers. Atleast for Prime Movers Transporter should have comprehensive cover. However, when we go for Hire Purchase / equipment finance , it is compulsory to take comprehensive cover before release of finance. By paying small additional premium of few hundreds you can get additional risks covered PA for Driver, Helpers & Third party property damage claim upto a maximum limit of Rs.7,50,000/-. For additional coverage MTO policy mentioned at sr. no. 1 can be taken.



4. Personal Accident Insurance Cover with Hospitalization benefit,

Every workmen/employee of the company should be covered with this policy in case of unfortunate accident resulting into death, permanent disablement/partial disablement. This is available at a very low premium and Transporter can take single policy to cover all the workmen including workers on contract. Sum insured to be decided based on the age, designation and earnings. Premium varies depending upon age.

In addition to accident cover, hospitalisation benefit due to accident also can be covered in the same policy by paying additional premium. This is tailor made policy.

case of death / injury during the course of duty as they work at high risk area like loading,unloading and working at height and live wire lifting jobs. This is available only for workmen and not for Officers and above. Premium depends on age, monthly salary etc. This also has medical extension provision. This policy is available for period weekly, monthly or annually.



5. Workmen Compensation Policy :

Majority of Transport Contractors avoid taking this policy unless their client asks for proof of such policy while executing the transport contract. Whether there is requirement from customer or not, every transporter must take this policy for statutory compliance and for the welfare of the workers and support their family in

6. Fire Insurance Policy :

This policy is an annual policy required to be taken for fire and earthquake risk cover for properties such as office building, warehouse and workshops including furniture and fittings, expensive transport equipments, spares and accessories. This policy cover earthquake and fire. Premium payable is very small.

7. Cash Policy :

Often Transport contractor's employees are required to draw and carry huge amount of cash from bank / office within and outside city and send to convoy moving on road for en route expenses, payment of taxes and the money is being carried by office boys/ junior staff without any security. If he is attacked by robbers he cannot fight and put his life at risk. Insurance companies provide cash policy which can cover following risks.



- Money for the payment of wages, salaries and other earning or for petty cash in direct transit from the bank to the insureds premises from the time the cash is received at the bank by the insured or the authorized employee/s of the insured until delivered at the premises or other place of disbursement and whilst there until paid out provided that out of business hours such cash shall be secured in locked safe or locked strong room on the premises. Cheques drawn by the insured to provide for such cash are covered in transit from the premises to the bank.
- Money (other than described in above) in the personal custody of the insured or the authorized employee/s of the insured whilst in direct transit between the premises and the bank or post office and vice versa.
- Money (other than described above) collected by and in the personal custody of the insured or the authorized employee/s of the insured whilst in transit to the premises or bank within a period not exceeding 48 hours from the time of collection and vice versa.

The annual premium for Rs.20 Lacs policy is approximately Rs.25,000/-

There are several other Insurance products available in the market like Site Erection policy, Group Medclaim Policy for employees, Employees Death Insurance Policy etc and the management has to take a call if they want to cover all risks.

Freight is covered in transit insurance claim :

Every transit Insurance Policy taken by client for Cargo covers Freight and is always CIF+10% of value and no client can deny payment of freight if goods damaged in transit as CIF covers freight also. Few clients do not pay the transporter in case of transit damage saying cargo received in damaged condition which is legally incorrect. Avoid issuing Damage Certificate and if unavoidable issue with some condition to protect your interest so that when Insurance Company makes claim on you, you can defend. Proper documentation is a must to avoid any unjustified claim coming on you.

Whom to approach for right cover?

Reputed Insurance Brokers who are well versed with Policy Requirement for Transport Contractors and they do not charge anything to transporters and offer best rates after comparing the quotes from various Insurance companies both Nationalized and Private.

Insurance brokers will also provide assistance/advise when there is a claim and prepare documents to protect Insurer's interest.

DO YOUR RISK ASSESSMENT BEFORE YOU MOVE THE CARGO AND TAKE PROPER LIABILITY INSURANCE COVER TO AVOID SURPRISES. IF YOU ARE IGNORANT, YOU WILL BE INVITING TROUBLE AND IT MAY CAUSE IRREPARABLE LOSS.

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PART II—Section 3—Sub-section (i)

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अधिसूचना

नई दिल्ली, 28 नवम्बर, 2016

सा.का.नि. 1096(अ).—केन्द्रीय मोटर यान नियम, 1989 का और संशोधन करने के लिए, मोटर यान अधिनियम, 1988 (1988 का 59) की धारा 212 की उपधारा (1) की अपेक्षानुसार प्रारूप नियम भारत सरकार के सड़क परिवहन और राजमार्ग मंत्रालय की अधिसूचना सा.का.नि. संख्यांक 951(अ) तारीख 8 दिसम्बर, 2015 द्वारा उन सभी व्यक्तियों से, जिनके उनसे प्रभावित होने की संभावना थी, प्रारूप नियम भारत के राजपत्र, असाधारण, भाग II, खंड 3, उपखंड (i) में प्रकाशित किए गए थे, उस तारीख से जिसको उक्त अधिसूचना से युक्त राजपत्र की प्रतियां जनता को उपलब्ध करा दी गई थी, तीस दिन की अवधि के अवसान से पूर्व आक्षेप और सुझाव आमंत्रित किए गए थे ;

और राजपत्र की प्रतियां जिसमें उक्त अधिसूचना प्रकाशित की गई थी, जनता को तारीख 8 दिसम्बर, 2015 को उपलब्ध करा दी गई थी ;

और उक्त प्रारूप नियमों की बाबत जनता से प्राप्त आक्षेपों और सुझावों पर केन्द्रीय सरकार द्वारा विचार कर लिया गया है ;

अतः, अब केन्द्रीय सरकार मोटर यान अधिनियम, 1988 (1988 का 59) की धारा 56 के साथ पठित धारा 64 के खंड (ड) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए केन्द्रीय मोटर यान नियम, 1989 का और संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात् :-

- (1) इन नियमों का संक्षिप्त नाम केन्द्रीय मोटर यान (21वां संशोधन) नियम, 2016 है ।
- (2) ये नियम राजपत्र में उनके प्रकाशन की तारीख को प्रवृत्त होंगे ।
2. केन्द्रीय मोटर यान नियम, 1989 (जिसे इसमें इसके पश्चात मूल नियम कहा गया है) के नियम 62 में,—

(क) उपनियम (1) में,—

(i) पहले परंतुक में "निरीक्षण अधिकारी के पश्चात्" "निरीक्षण अधिकारी के पश्चात्" शब्द रखे जाएंगे ;

(ii) दूसरे परंतुक के पश्चात् निम्नलिखित परंतुक अंतःस्थापित किया जाएगा, अर्थात् :-

"परंतु यह भी कि यदि प्रथम परंतुक के अधीन सारणी में विनिर्दिष्ट परीक्षणों का संचालन किसी राज्य/संघ राज्यक्षेत्र, जहां यान का रजिस्ट्रीकरण किया गया था, से भिन्न किसी राज्य/संघ राज्यक्षेत्र में किसी निरीक्षण अधिकारी या प्राधिकृत परीक्षण केंद्र में किया जाता है तो निरीक्षण अधिकारी, जिसने जांच का संचालन किया है, उसी दिन या अगले कार्यदिवस को उसकी निरीक्षण रिपोर्ट को प्ररूप 38क में <http://parivahan.gov.in/vahan> पोर्टल पर अपलोड करेगा और अपने हस्ताक्षर और मुहर के अधीन निरीक्षण रिपोर्ट को रजिस्ट्रीकरण प्राधिकारी को निरीक्षण रिपोर्ट की तारीख से 15 दिन के भीतर यदि निरीक्षण अधिकारी द्वारा यान अधिनियम और नियमों के उपबंधों की अनुपालना करने वाला पाया जाता है तो रजिस्ट्रीकरण प्राधिकारी द्वारा उपयुक्तता प्रमाणपत्र जारी करने के लिए स्पीड पोस्ट से भेजेगा और उसकी एक प्रति यान के चालक को दी जाएगी :

परंतु यह भी कि यदि अगला उपयुक्तता प्रमाणपत्र रजिस्ट्रीकरण प्राधिकारी के राज्य/संघ राज्यक्षेत्र से निरीक्षण अधिकारी या किसी प्राधिकृत जांच केंद्र से अभिप्राप्त किया जाता है, जहां यान का रजिस्ट्रीकरण किया गया है।";

(iii) स्पष्टीकरण में, "राज्य सरकार द्वारा नियुक्त" शब्दों के स्थान पर "राज्य सरकार द्वारा नियुक्त" शब्द रखे जाएंगे ;

(ख) उपनियम (2) के पश्चात्, निम्नलिखित उपनियम अंतःस्थापित किया जाएगा, अर्थात् :-

"(3) किसी यान की जांच के लिए फीस, जब निरीक्षण अधिकारी से भिन्न किसी निरीक्षण अधिकारी या प्राधिकृत जांच केंद्र द्वारा रजिस्ट्रीकरण प्राधिकारी के कार्यालय में जांच की जाती है, नियम 81 में यथा विनिर्दिष्ट होगी।"

3. मूल नियमों के नियम 81 में, सारणी में, क्रम सं. 11 और उससे संबंधित प्रविष्टियों के पश्चात् निम्नलिखित क्रम सं. और प्रविष्टियां अंतःस्थापित की जाएंगी, अर्थात् :-

(1)	(2)	(3)	(4)	(5)
"11क.	रजिस्ट्रीकरण प्राधिकारी के कार्यालय में निरीक्षण अधिकारी से भिन्न किसी निरीक्षण अधिकारी या प्राधिकृत परीक्षण केंद्र में रजिस्ट्रीकरण प्राधिकारी द्वारा उपयुक्तता का प्रमाणपत्र अनुदत्त या नवीकृत किए जाने के लिए किसी यान का परीक्षण का संचालन करना		62(2)	
	मोटर साईकिल	मैनुअल : दौ सौ रुपए स्वचालित : चार सौ रुपए		
	तिपहिया या हल्का मोटरयान या चौपहिया	मैनुअल : चार सौ रुपए स्वचालित : छह सौ रुपए		
	मध्यम या भारी मोटरयान	मैनुअल : छह सौ रुपए स्वचालित : एक हजार रुपए		

4. प्ररूप 38 के पश्चात् निम्नलिखित प्ररूप अंतःस्थापित किया जाएगा, अर्थात् :--

"प्ररूप 38क

[देखिए नियम 62(1)]

रजिस्ट्रीकरण प्राधिकारी के कार्यालय में निरीक्षण अधिकारी से भिन्न किसी निरीक्षण अधिकारी या प्राधिकृत परीक्षण केंद्र द्वारा संचालित किसी परिवहन यान की निरीक्षण रिपोर्ट

यान, जिसकी रजिस्ट्रीकरण सं. है, का अद्योहस्ताक्षरी द्वारा आज निरीक्षण किया गया है और यह प्रमाणित किया जाता है कि यह मोटरयान अधिनियम, 1988 (1988 का 59) और केंद्रीय मोटरयान नियम, 1989 के उपबंधों का अनुपालन करता है तथा यह रजिस्ट्रीकरण प्राधिकारी द्वारा उपयुक्तता प्रमाणपत्र जारी किए जाने के लिए उपयुक्त है।

यह रिपोर्ट <http://parivahan.gov.in/vahan> पोर्टल पर अपलोड की जाएगी और मेरे हस्ताक्षर और मुहर के अधीन रजिस्ट्रीकरण प्राधिकारी को आज या अगले कार्य दिवस को स्पीड पोस्ट द्वारा आवेदन के प्रक्रमण यान के संबंध में रजिस्ट्रीकरण प्राधिकारी द्वारा उपयुक्तता प्रमाणपत्र जारी करने के लिए भेजी जाएगी।

तारीख

स्थान

निरीक्षण अधिकारी का हस्ताक्षर, नाम और पदनाम या प्राधिकृत परीक्षण केंद्र के प्राधिकृत पत्र धारक के हस्ताक्षर
सडंक परिवहन कार्यालय, जहां तैनात है

जिला

राज्य

शासकीय मुहर।"

[सं. आरटी-11028/15/2015-एमवीएल]

अभय दामले, संयुक्त सचिव

टिप्पण : मूल नियम भारत के राजपत्र, असाधारण, भाग II, खंड 3, उपखंड (i) में अधिसूचना सं. सा.का.नि. 590(अ), तारीख 2 जून, 1989 द्वारा प्रकाशित किए गए थे और अंतिम संशोधन सा.का.नि. सं. 1034(अ), तारीख 02.11.2016 द्वारा किया गया।

MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

NOTIFICATION

New Delhi, the 28th November, 2016

G.S.R. 1096(E).—Whereas the draft rules further to amend the Central Motor Vehicles Rules, 1989, were published, as required under sub-section (1) of section 212 of the Motor Vehicles Act, 1988 (59 of 1988), vide notification of the Government of India in the Ministry of Road Transport and Highways number G.S.R. 951(E), dated the 8th December, 2015 in the Gazette of India, Extraordinary, Part-II, Section 3, Sub-section (i) inviting objections and suggestions from persons likely to be affected thereby before the expiry of the period of thirty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS, copies of the said Gazette notification were made available to the public on the 8th December, 2015;

AND WHEREAS, the objections and suggestions received from the public in respect of the said draft rules have been considered by the Central Government;

NOW, THEREFORE, in exercise of the powers conferred by clause (n) of section 64 read with section 56 of the Motor Vehicles Act, 1988 (59 of 1988), the Central Government hereby makes the following rules further to amend the Central Motor Vehicles Rules, 1989, namely: —

1. (1) These rules may be called the Central Motor Vehicles (21st Amendment) Rules, 2016.
(2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Central Motor Vehicles Rules, 1989 (hereinafter referred as the principal rules), in rule 62,-
 - (a) in sub-rule (1),-
 - (i) in the first proviso, for the words “after the Inspecting Officer”, by the words “after an Inspecting Officer” shall be substituted;
 - (ii) after the second proviso, the following proviso shall be inserted, namely:-
 “Provided also that if the tests specified in the Table under the first proviso are conducted by an Inspecting Officer or authorised testing station in a State/ Union Territory other than the State/ Union Territory where the vehicle is registered, the Inspecting Officer who conducted the tests shall, on the same day or on the following working day, upload his inspection report in Form 38A at the portal <http://parivahan.gov.in/vahan> and also send the inspection report signed under his hand and seal to the registering authority by speed post for issue of certificate of fitness by the registering authority within fifteen days from the date of the inspection report, if the vehicle is found by the Inspecting Officer to be in compliance with the provisions of the Act and rules and a copy shall be given to the driver of the vehicle:

 Provided also that the next fitness certificate is obtained from the inspecting officer or an authorised testing station in the State/ Union Territory of the registering authority where the vehicle is registered.”;
 - (iii) in the Explanation, for the words “appointed by the State Government” the words “appointed by a State Government” shall be substituted;
 - (b) after sub-rule (2), the following sub-rule shall be inserted, namely:-
 “(3) The fee for testing of a vehicle when tested by an Inspecting Officer or authorised testing station, other than the Inspecting Officer in the office of the registering authority, shall be as specified in rule 81.”.
3. In rule 81 of the principal rules, in the Table, after the serial number 11 and the entries related thereto, the following serial number and entries shall be inserted, namely:-

(1)	(2)	(3)	(4)	(5)
“11A.	<p>Conducting test of a vehicle by an Inspecting Officer or Authorized testing station other than the Inspecting Officer in the office of the registering authority for grant or renewal of certificate of fitness by the registering authority</p> <p>Motorcycle</p> <p>Three wheeled or light motor vehicle or quadricycle</p> <p>Medium or heavy motor vehicle</p>	<p>Manual: Two hundred rupees</p> <p>Automated: Four hundred rupees</p> <p>Manual : Four hundred rupees</p> <p>Automated: Six hundred rupees</p> <p>Manual: Six hundred rupees</p> <p>Automated: One thousand rupees</p>	62(2);	

4. After Form 38 of the principal rules, the following Form shall be inserted, namely:-

“FORM 38A

[See rule 62(1)]

Report of inspection conducted on a transport vehicle by an Inspecting Officer or authorised testing station, other than the Inspecting Officer in the office of the registering authority

Vehicle bearing registration number has been inspected by the undersigned today and it is certified that it complies with the provisions of the Motor Vehicles Act, 1988 (59 of 1988) and the Central Motor Vehicles Rules, 1989 and is fit for issue of a Fitness Certificate by the registering authority.

This report will be uploaded at the portal <http://parivahan.gov.in/vahan> and the inspection report signed under my hand and seal will be sent to the registering authority by speed post either today or on the next working day for processing the application for issue of certificate of fitness in respect of the vehicle by the registering authority.

Date

Signature, name and designation of the
Inspecting Officer or Sign of holder of

Place

Authority letter of authorised testing station

Road Transport Office in which posted.-

District-

State-

Official seal.”.

[No. RT-11028/15/2015-MVL]

ABHAY DAMLE, Jt. Secy.

Note : The principal rules were published in the Gazette of India, Extraordinary, Part-II, Section 3, sub-section (i), vide notification number G.S.R. 590(E), dated the 2nd June, 1989 and last amended vide notification number G.S.R.1034 (E) dated the 02nd November, 2016.



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Aditya Sharma

CONDITIONAL ASSESSMENTS AND STRENGTHENING OF RANGPU CHU BRIDGE FOR CARRYING THE OWC CONSIGNMENTS

A

Abstract

India is rapidly developing country, which propel the growth in various sectors of power and infrastructure like railway, roads, ports and power. With the increase in demand for infrastructural growth, Hydro, Nuclear and Thermal power plants in particular are planned in different parts of the country. This has led to transportation of Over-Weight Consignments (OWC) from ports and manufacturing units to the project sites. These OWC's are to be transported through existing roads and bridges, which are originally designed for standard IRC loads. Bridges are the structures built to span physical obstacles such as a body of water, valley or road for the purpose of providing passage over the obstacles. The role of bridge becomes crucial when its being only mode of access to connect the isolated state with rest of the world. These types of bridges should be maintained with high importance with regular condition assessments and rehabilitation. This paper presents the conditional assessments and rehabilitation of Rangpu Chu Bridge which connects the state of Sikkim with rest of the country for shipment of OWC consignments for a hydroelectric power plant, which is under construction.

1. INTRODUCTION

Teesta River is said to be the life line of Indian state of Sikkim, flowing for almost length of the state and carving out

verdant Himalayan temperate and tropical river valleys. The power generation potential of the Teesta Basin is estimated to be 7046 MW. The power potential of Teesta river itself is planned to be harnessed through a cascade of six hydro projects and the third stage of this cascade is the 1200 MW, Teesta – Stage III hydroelectric power (HEP) project - the biggest of the six schemes, located at North Sikkim district of the state of Sikkim with dam at Chugthang Village and the Power House site at Singhik. For the construction of Teesta - stage III H.E.P requires transportation of OWC's en-routing the existing bridges. It is assumed that these existing bridges were originally designed for standard IRC: 6[1] loads and for the Shipment of OWC's on these bridges, assessment of strength/capacity of the existing bridges are quite essential.

The project stretch from Sevoke West Bengal to Teesta Stage III H.E.P Sikkim at village Singhik comprises of 36 Bridges, among which few bridges are under distressed conditions. This paper presents the detailed assessment study of Rangpo Bridge.

The bridge across Rangpo (tributary of River Teesta) is one among the important bridge in the stretch, through which the OWC consignments needs to transport. The details of the consignments to be transported are mentioned in Table 1 and the details of Hydraulic Trailer and the axle arrangement is shown in Fig 2.

Table 1: Details of Consignments

Sl. No	Description of Consignments	Qty. to be transported	Weight of Consignment	Type of Trailer used for OWC transportation
1	Generator Transformer (Nitrogen Filled Tank)	19 Nos.	72.0MT	HT3
2	Generator Shaft	5 Nos.	75.8MT	HT3/HT4
3	Main Inlet Valve	6 Nos.	62.5MT	HT2
4	Butterfly Valve	2 Nos.	33.0MT	HT1

2. DETAILS OF THE BRIDGE

A single span steel truss bridge is located across Rangpu at chainage 52.100km from Sevoke, West Bengal. This bridge is the only access to India's second smallest state Sikkim from rest of the country. Rangpu Bridge as shown in Fig.1 is a Camel Back Pratt type steel truss bridge spanning 70.0m center to center of the bearing. Cast in-situ reinforced deck slab is supported on five longitudinal stringers. The outer to outer width of the superstructure is 8.7m. The total deck width of the slab is 8.0m with clear carriageway of 7.5m. The center to center spacing of the two trusses is 8.3m, each truss is composed of 10 numbers of bays with bay width being 7.0m center to center.



Fig 1: Rangpu Steel Truss Bridge
(Taken From upstream side)

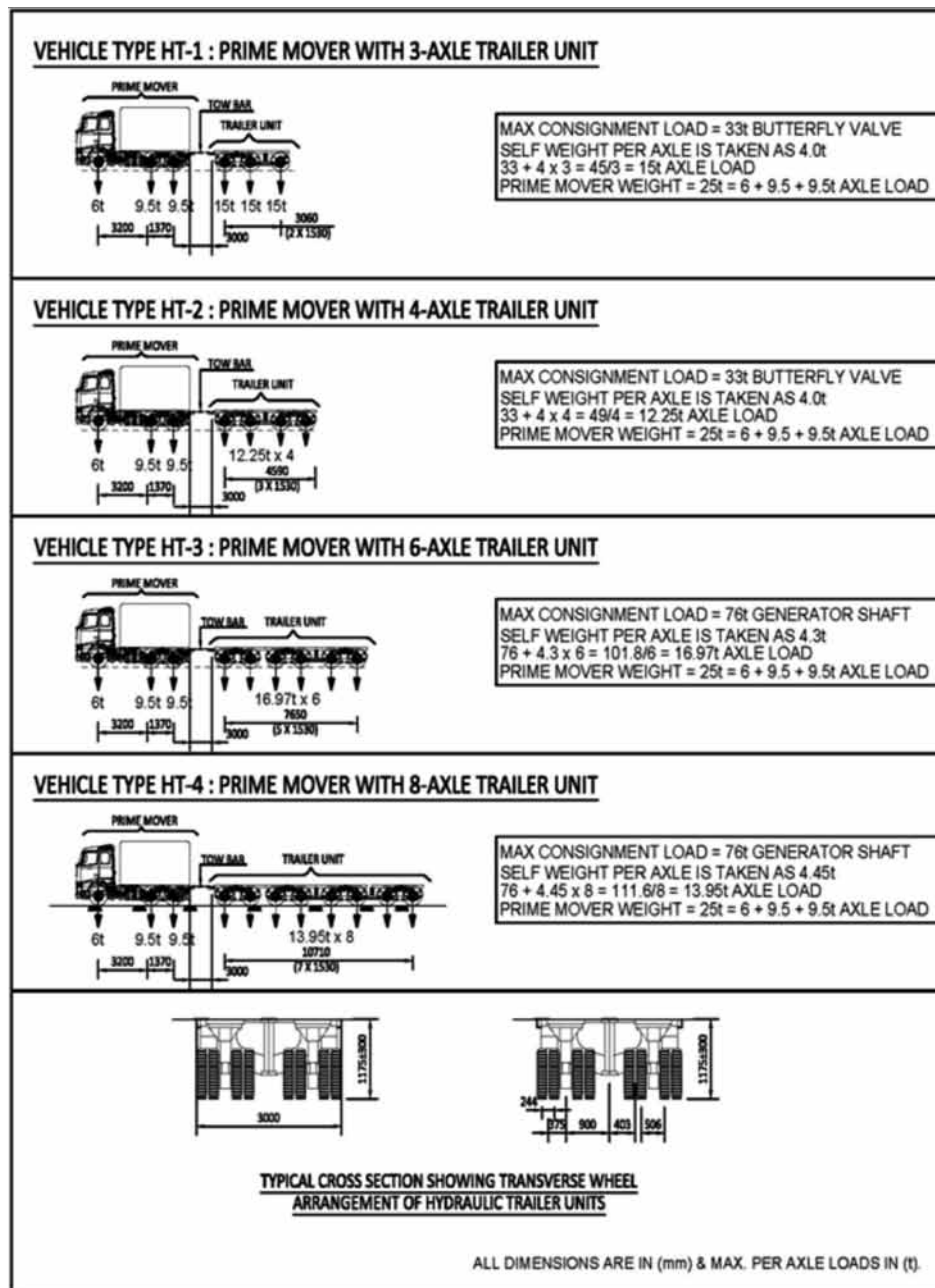


Fig 2: Details of OWC Hydraulic Trailers (Axle Arrangement and loads)

3. SCOPE OF STUDY

The scope of study involves four broad stages which are as detailed below:

- Visual/condition inspection of Bridge, for accessing the present conditions, distress level and to note the structural dimensions of the bridge to its nearest accuracy.
- Analytical study of bridge superstructure to evaluate the overstressed load carrying capacity of the bridge from the noted dimensions from inspection with reduction factors based on the distress level.
- Carrying out superstructure load test to ensure its actual load carrying capacity confirming to deflection criteria.
- To suggest repair strengthening and rehabilitation measures if required.

4. VISUAL INSPECTION

Bridges are the vital infrastructure elements of highway network. Maintaining serviceability of bridges and consequently retaining their level of reliability during their life time deserves high priority from techno-economic considerations.

The visual inspection of this bridge was carried out as per IRC SP: 35[3] which specifies guidelines for inspection of road bridges. The visual

inspection of Rangpo steel truss bridge was carryout on 13/10/2012 and congregated with following observations and the same is represented in Fig.3 to 6.



Fig 3: Immense rusting/corrosion of bottom chord at bearing location



Fig 4: Rusting of exposed deck slab r/f. & rusting/scaling of bottom chord members



Fig 5: Corrosion of bottom chord truss members.



Fig 6: Metallic bearing filled up with non/biodegradable waste and water.

4.1. Observations

- During visual inspection, immense rusting/scaling of the main structural bottom chord members was observed.
- Metallic bearings were provided, which were encased with steel plates around them. The bearing casing was filled with the soil mud and non/biodegradable waste and water. Thereby leading rusting/corrosion of the bearing plate elements.
- Rusting/scaling of other main structural members was also observed in many members mainly in stiffener plates.

- The bottom chord members at junctions of bearing were immensely rusted / corroded.

- Spalling of concrete/honey combing was observed on bottom surface of the deck slab.
- Rusting/scaling of exposed deck slab reinforcements was also observed.

4.2. Rating of the Bridge

On the basis of visual inspection, bridges have been categorized in three classes depending on which suitable strength reduction factors shall be applied on over strength capacities during next (analytical checks) level of checks. The categorisation of type of class is as below

- i) Class - 1: The Bridges which are newly constructed and do not shown any signs of distress are rated as Class-1. In this category it is presumed that there may not be any problem when heavy class of consignments (as presumed) is plyed through. However actual condition shall be determined after carrying out analytical check. Requirement of load test shall be decided accordingly.
- ii) Class - 2: The Bridges which are not very old and are found in fair conditions with certain level of defects are rated as class -2. For this category of bridges detail analytical checks shall be performed, if required load test of superstructure for full load (equal to HT Consignment) shall be carried out to ensure safe movement of OWC loads.
- iii) Class - 3: The Bridges which appear to be very old and are partially or in distressed condition and may need some strengthening measures are rated as Class-3. The above class of Bridges shall be first rated for its load carrying capacity as per procedure laid down in IRC-SP: 37[4] publication.

As per visual inspection of Rangpo Bridge, it is rated as class 2, for which detail analytical checks shall be performed, if required load test of superstructure for full load (equal to HT Consignment) shall be carried out to ensure its safemovementsof OWC loads.

Since the "As built" drawings were not readily available, the dimension/section properties of the structural components of the bridge are taken from the inventory report. The inventory of accessible components of bridge are measured and noted. The dimensions of various components of bridge which are inaccessible are assumed to the nearest accuracy for analytical checks.

5. ANALYTICAL CHECKS

As per Cl. 5.1.i IRC: SP: 37[4], analytical method is applicable when the "as built" or contract drawings and specifications followed are available, or when such drawings can be prepared by site measurement to an acceptable level of accuracy. In this case the as built drawings were not readily available and the dimensions of accessible components of the bridge are noted from inspection/inventory areusedfor carrying out analytical checks.

The factor "KSTG", is the ratio of load effect caused by IRC loading (duly enhanced by the permissible overstressing as per Clause 11 of IRC: SP-37[4]) to the load effects caused by HT loading.

As per Annex 1 of IRC SP: 37[4], for structural steel and mild steel, 45% overstressing can be considered while rating

the bridges. Based on the visual inspection carried out for the truss bridge, it was observed that the various structural members (bottom chord, top chord, vertical and inclined members) have distress due to rusting, scaling, etc. hence it was felt that allowing 45% overstressing on this truss bridge is not appropriate. As a result a suitable reduction has to be applied on the overstressing factor to account for distress.

Also as per clause 506.1 of IRC: 24[2], 25% overstressing is permitted under Wind Load Combination referring to Table 6.1, section V of IRC: 24[2].

Further as per clause 512.3.3 of IRC: 24[2] Connections of members at intersection shall develop at least 1.10 times the design loads and moments transmitted by the members.

For the steel truss bridges strength of the individual members and also the connection connecting these members are of paramount importance. Hence the minimum of these criteria has been adopted as the overstressing capacity for the truss bridge.

5.1. Design Principles

Let 'p' be the % overstressing in stresses that the steel truss members can take over and above the design axial forces caused by dead and IRC live loads during the passage of OWC. The following equation gives the relationship between 'p' & 'KSTG'.

$$K_{STG} = \frac{(DL + LL_{IRC})}{(DL + LL_{HT})} \times \left(1 + \frac{p}{100}\right)$$

.....Eq. 1

Where:

DL = Effect of Self weight of the truss, deck slab & Superimposed Dead Load at a given section.

LLIRC = Effect of IRC Carriageway Live Loads at a given section.

LLHT = Effect of HT Live Loads at a given section.

'p' = The permissible overstress (in percentage) on (DL+LL) combination over and above the stresses permitted, which is considered as 10% for steel truss bridges and also as per visual inspection.

'KSTG' = The ratio of load effect caused by IRC: 6[1] loading (duly enhanced by the permissible overstressing) to the load effect caused by HT loading.

5.2. Analysis and Results

The axial forces in each of the truss members have been analysed for each load cases (DL, SIDL & IRC live loads). The combined axial forces due to DL, SIDL & IRC: 6[1] live loads for individual truss members are enhanced by overstressing factor of 1.10. Similarly the axial forces of individual truss members due to HT loadings (HT1, HT2, HT3 & HT4) carrying respective consignments are also analysed. The KSTG factor has been worked out as per Eq 1 for each member of the truss. The summary results are tabulated and have been presented in Table. 2 showing the critical KSTG factor for structural components (Top chord, Bottom chord, vertical & inclined members).

Table 2: Critical KSTG for Structural Members of the Truss Bridge

HT Type	Bottom Chord Members		Top Chord Members		Vertical Members		Incline Members	
	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical
	K_{STG} (Comp)	K_{STG} (Tens)	K_{STG} (Comp)	K_{STG} (Tens)	K_{STG} (Comp)	K_{STG} (Tens)	K_{STG} (Comp)	K_{STG} (Tens)
HT-1	-	2.58	2.63	-	1.90	1.88	1.61	1.96
HT-2	-	2.47	2.51	-	1.90	1.92	1.71	1.92
HT-3	-	1.44	1.48	-	1.13	1.16	1.14	1.15
HT-4	-	1.37	1.40	-	1.17	1.16	1.14	1.15

5.3. Observations

- Based on the analytical checks, it is concluded that if the value of factor KSTG is greater than 1, the envisaged trailers can be permitted to move on the bridges without any restriction from axial capacity criteria of the truss members.
- From analytical checks, it is evident that the critical KSTG factor for all structural members (Top chord, Bottom chord, vertical & inclined members) for the truss bridge across Rangpo is greater than 1.0. Hence it is recommended that the identified trailers can safely pass on these bridges subject to satisfying the deflection criteria by carrying out actual load test on the superstructures.

6. LOAD TEST

Based on hypothetical live load trains cannot be directly used for putting controlled restriction of traffic actually plying on the bridge.

Load testing of bridges are performed to ensure the strength of all the elements of existing structure, when few structural behaviour or checks can't be ensured with analytical checks alone.

Steel bridges are prone in deflection mode of failure. Rangpo chu bridge being steel truss bridge, deflection is being potential failure mode. Hence to ensure the structural strength in deflection checks, load testing of the bridge was performed.

6.1. Scope and Load Test Procedure

- Preparation and submission of Load Test Procedure to assess the capacity of the bridge in accordance with relevant latest codes of IRC-SP: 37[4] & IRC - SP: 51[5] and incorporating the suggestion/observations for approval from Border Roads Organization (BRO), wherever required.

- Supervision of Load Testing activity at site.
- Report on assessment of the capacity of the bridges after load testing and in case the accessed bridges not meeting the requirement for transportation of heavy consignments, suggesting the remedial measures/strengthening requirement of bridge structures.
- During inspection and also discussions with officials of BRO, it was perceived that the bridge has undergone permanent deflection to considerable amount. In view of the distressed condition and also importance of the bridge, it was considered appropriate not to carry out full load test on the bridge. It was suggested by BRO that the load test should be conducted up to 75% of test load, and the load carrying capacity of the bridge can be judged from load/deflection behaviour.
- Evaluating the strength by extrapolating load/deflection behaviour was under conservative side. Hence it was agreed that, in case the superstructure satisfies 75% of test load, the heavy consignment weighing 125T may be conveyed by detaching the puller (weighing 25T) and the trailer part weighing 100T may be towed away by means of wire rope with necessary precautions.

- As per scheme, the test load of 125T was to be applied in 4 stages in increments of 25%, 50%, 75% and 100%. But as per instructions from BRO it was proposed to apply test load up to stage III (75%).

6.2. Results and Observations

- The main objective is to pass through the consignment trailers having gross weight of 125 MT, it was checked through STAAD analysis, as how much axial forces would develop in the middle members of truss, so that the amount of test load is worked out, which will produce similar forces.
- As per site conditions and availability, three dual axle tandem vehicles were arranged and were loaded with available steel plates. Each vehicle was loaded to form a gross weight of 31T each and the third vehicle was loaded with a load of 34T to form a total load of 93T which is around 75% of OWC trailer HT3 load of 125 T.
- The dimensions and axle spacing of each trailer vehicle were measured and recorded to work out axle loads on each axle depending upon the position of loaded materials over trailers. The above loads were therefore divided in to 3 stages, 33%, 66% and 100% so that the loads are applied gradually in successive increments and to observe that the deflections occurred under each stage of loading remain within permissible calculated limits.
- With the above stages of loading, the theoretical deflections were worked out under each stage of loading to compare the same with actual deflections occurred during load testing. The stage wise theoretical deflections at each stage of loading are presented in Table 3.
- As per the approved scheme, the load test was conducted at site on 24-05-2013 early morning.
- After applying first test vehicle (for stage I loading), it was noticed that the mid span deflection on LHS edge was crossing the theoretical limits but this was exceeding within 10 % of deflection, i.e the deflection was 12.00 mm against the theoretical value of 10.5 mm. However the deflection on RHS edge was within limits.
- The difference in LHS and RHS side deflection values were due to asymmetrical placement of the test vehicles. However worst side is considered for ascertaining the strength.
- Further loading for stage II was done and again noticed that, the deflection on LHS was exceeding by 10%. The test was however continued.

- The next vehicle for stage III was added in succession and deflection readings at mid spans of both the LHS and RHS trusses were recorded through leveling instrument. It was thoroughly checked and ensured that in each stage of loading the CGs of test vehicles were matched with CG of the bridge. The following deflections were measure.
- The photographs of load testing of Rangpo Bridge with each stage of loadings are presented in Fig 7 to 10.



Fig 7: Carrying out of Load Test on Rangpu Bridge
(Taken From Sevoke, West Bengal side)



Fig 8: Stage-I Loading of Load Test on Rangpu Bridge
(Taken From Sevoke, West Bengal side)



Fig 9: Stage-II Loading of Load Test on Rangpu Bridge
(Taken From Rangpo, Sikkim side)



Fig 10: Stage-III Loading of Load Test on Rangpu Bridge
(Taken From Rangpo, Sikkim side)

Table 3: Details of Theoretical and Actual Deflection Results

STAGE	LOAD APPLIED (MT)	DEFLECTION (mm) LHS (D/S)		DEFLECTION (mm) RHS (U/S)	
		Theoretical	Actual	Theoretical	Actual
STAGE-I	31.0	10.5	12.0	4.0	2.0
STAGE-II	62.0	15.5	20.0	13.5	8.0
STAGE-III	96.0	20.0	25.0	22.0	11.0

- At stage III loading, it was noticed that the deflection on LHS edge crossed 25% excess limit as the deflection noted was 25mm against theoretical value of 20 mm. A comparative statement showing theoretical vs actual deflections under test loads is depicted in Table 3.
- It was then concluded that the bridge is not capable of sustaining further loads and the loads applied were removed.

6.3. Conclusion And Recommendation of Load Test

The detail study of conditional assessments of Ranpu Steel Truss Bridge is carried out in all the stages of study and found with the following conclusions.

- The detail visual inspection of the bridge was carried out as per the guidelines of IRC SP: 35[3]. Based on the visual inspection a reduction factor is recommended for reducing the overstressing coefficient for assessing the overstressed capacity as per IRC: SP: 37[4] of the structural members.
- The analytical checks were carried out, considering the suitable reduction factor based on the visual inspection. The factor KSTG is greater than 1.0 evident that the overstressed axial strength capacity of the structural members/bridge is greater than the loads due to the envisaged trailer carrying the OWC consignment.
- To assess the capacity of the bridge due to deflection criteria the actual load test was carried out as per the guidelines of IRC SP: 37[4].
- The Left hand down stream side truss/ (LHS) truss of bridge has shown deflection beyond limits. Thus truss appears to be weak and incapable of taking heavy consignment loads. The bridge needs to be strengthened by suitable means. Since it is difficult to carryout strengthening of truss members, it is suggested to provide some vertical supports under the trusses, so that when consignment load passes through the bridge it transforms some loads at additional support.

7. REHABILITATION/STRENGTHENING OF THE BRIDGE

After performing of Load test on Rangpo bridges, it is concluded that the bridge is insufficient to carry the consignment safely, in respect to deflection criteria. Hence it is recommended for carrying out rehabilitation of the bridge.

- The bridge site was examined for exploring possibility of providing an additional support intermediate to the span of the bridge.
- It was observed that the depth flow varies w.r.t cross section of river underneath the bridge. The flow was quite moderate at middle due to which it was difficult to provide support at centre of the span.
- It was however seen that some portion of dry land/island where flow is minimal near thesevoke side abutment. A dry island can be extended below the bridge by providing suitable arrangements of stone boulder block crates mixed with dry lean concrete.
- The Steel column support with wooden flat planks below the truss joint L3 was provided over the well prepared foundation bed as mentioned in Fig 11. The connection between the steel column support and truss connection joint is disjointed, such that it doesn't causes any adverse effect in behaviour of truss bridge.
- The Fig 11 presents the scheme of rehabilitation/ additional support arrangements of Rangpo Bridge.

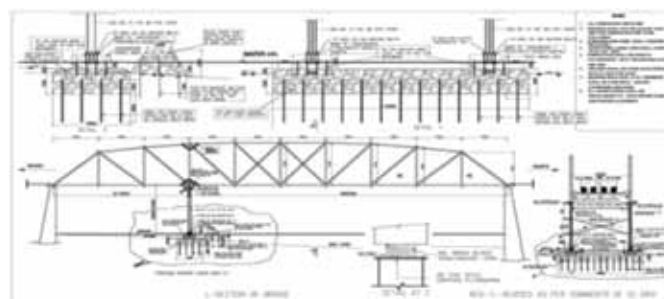


Fig 11: Scheme of Rehabilitation (Drawing issued for execution)

8. LOAD TEST ON REHABILITATED BRIDGE

- Based on the initial load test carried out on 24-05-2013, it was revealed that the bridge was showing deflections more than the theoretical limits. Looking in to the prevailing conditions of bridge, the earlier load test was conducted for 75% loading only, and the bridge was found to be unsafe under heavy consignment loading of HT3 type.
- The bridge was therefore proposed to be strengthened by providing an intermediate support. It was suggested that the bridge shall be load tested once again for full load after strengthening of bridge, to ensure the level of rehabilitation achieved or/and strength of the bridge enhanced.
- The strengthening arrangements had been completed by 09-07-2013.
- The load test on rehabilitated bridge was performed with the procedure same as mentioned in section 6 with additional intermediate support.
- The truss bridgeStaad model is analysed, to evaluate as howmuch axial force would develop in the truss members due to HT vehicle gross weight of 125 MT , so that the amount of test load is evaluated which will produce similar forces in the member.
- Similarly the revised theoretical deflection values with additional support conditions for each stages of loadings are presented in Table 4.
- The bridge was load tested for full load which was applied in 4 stages in increments of 25%, 50%, 75% and 100%.
- Four numbers of test vehicles were arranged loaded with local soil to form gross weight of 30.5MT each. Thus forming total test load of 122MTwhich is being equivalent to OWC HT3 trailer load of 125MT.
- The deflections observed at mid span of both the trusses are presented in Table 4. The deflection levels as per the load test of rehabilitated bridge shows that the bridge can carry the HT trailer carrying OWC consignment safely over the bridge.



Fig 12: Stage-I Loading of Load Test on Rehabilitated Rangpu Bridge
(Taken From Rangpo, Sikkim side)



Fig 13: Stage-II Loading of Load Test on Rehabilitated Rangpu Bridge
(Taken From Rangpo, Sikkim side)



Fig 14: Stage-III Loading of Load Test on Rehabilitated Rangpu Bridge
(Taken From Rangpo, Sikkim side)



Fig 15: Stage-IV Loading of Load Test on Rehabilitated Rangpu Bridge
(Taken From Seveok, West Bengal side)

Table 4: Theoretical and Actual Deflection Results of Rehabilitated Bridge

STAGE	LOAD APPLIED (MT)	DEFLECTION (mm) LHS (D/S)		DEFLECTION (mm) RHS (U/S)	
		Theoretical	Actual	Theoretical	Actual
STAGE-I	30.50	5.50	02.00	2.00	01.00
STAGE-II	61.00	8.00	04.00	7.00	03.00
STAGE - III	91.50	12.00	07.00	8.50	05.00
STAGE -IV	122.00	14.00	09.00	12.00	07.00

9. CONCLUSION

- As per above detailed study on the important life line bridge of our country, it is recommended to carry the OWC’s consignment over the envisaged trailer with all the precautionary measures as mentioned in Annexure I of Ministry guidelines on Movement of OW/OD consignment Guidelines [6] strictly.
- After all the rehabilitation measures of Rangpo bridge along with few other bridges along the stretch, the shipment of all OWC consignments as mentioned in Table 1 were carried out on the respective envisaged HT trailers with the recommended precautionary measures on the bridges safely without causing any permanent distress to the bridges along the stretch and Ranpo Bridge.

However the rehabilitation measures taken were only for time being or for the purpose of shipment of concerned OWC consignment on Rangpo bridge/bridges along the stretch. We the team of bridge engineers suggests for the proposal of one or more robstic bridges at the locations where the role of the bridges being crucial and its distressing leads to dis-connectivity of the state/place from rest of the world.

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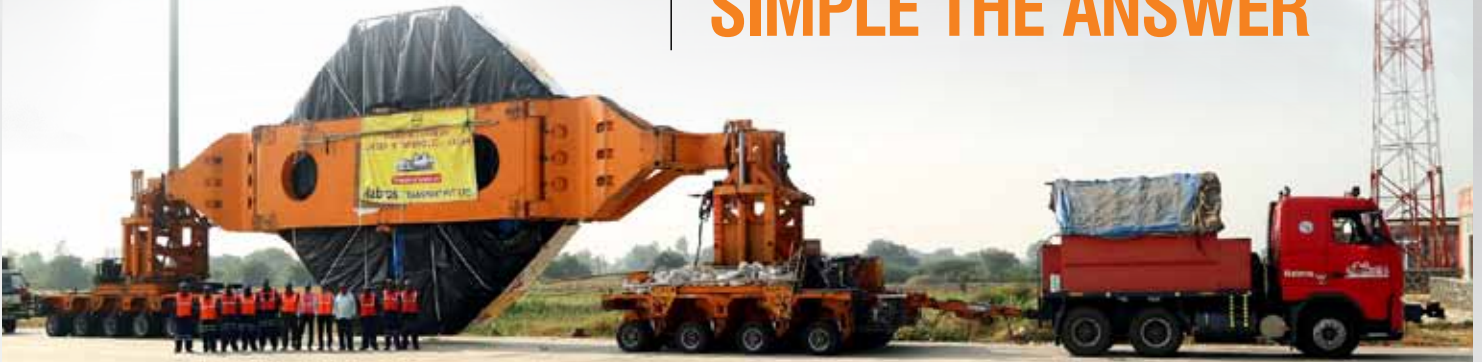
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1. A short view over our history

With an experience of over 50 years is Faymonville one of the biggest manufacturers of semi-trailers for special and heavy haulages. Faymonville provides their customers optimal solutions and systems for any transport need outside the usual norms. Areas of use are: construction machines, industrial parts, wind power plants, crane systems and many more. Quality, flexibility, productivity, creativity and service are the company's keywords. The range of products and services is constantly enlarged in tight collaboration with our customers. The high level of innovation and the excellent manufacturing quality of our products are secured by our own modern production plants and optimized production processes.

Up until the beginning of the 1960s, the sale of agricultural machinery and tractor cabins was the main business. In 1962, Berthold Faymonville builds a new production unit and manufactures and sells forestry vehicles. At the end of the 1960s, the first semitrailer is built and the production range is quickly extended, with the addition of the first lowbed semitrailer for the transport of glass (1973), the first inloader for the transport of glass (1977) or the first extendable hydraulic steered semi-trailer in 1980. From 1980, Faymonville becomes the specialist in special transport. The years go by and expansion proves necessary.



New production facilities have been built in Belgium (1988), Luxembourg (2003) and Poland (2006). Several enlargements of all these production sites have been done during the years.

The Faymonville group of companies is still under the direct control of the founding family: its sixth generation, brothers Alain and Yves Faymonville, head this diverse operation. The simple village blacksmith's forge where things began is a long way from modern world-wide business trading, yet the company has maintained refreshingly short lines of communication between senior managers and the factory floor.

2. Products, services and global strategy

Faymonville has built a solid reputation in the manufacturing of customized and mission-critical semi-trailers for a wide range of special transport or heavy haulage missions. The product range encloses 16 kind of trailers for different transport needs. Along our slogan: Trailers to the MAX!

The company manufactures trailers and semi-trailers, with payloads from 20 to 2,000 tons, enabling to satisfy all requirements in the area of transport with a difference. Faymonville trailers can be semi-trailers, low bed trailers, platform trailers or modular trailers.

And this around the world from Norway to South Africa, from Malaysia to Canada. We export our products to the five continents and present our vehicles on trade fairs all over the world – for example now also in India at BC India event.

The distribution of Faymonville semi-trailers is ensured by our sales representatives or through an international network of authorized dealers.

3. Infrastructure and technical know-how

High level of investment in plant and machinery is maintained at all three production sites. Büllingen in Belgium (surface 29,725 m²), Lentzweiler in Luxembourg (surface 36,250 m²) and Goleniow in Poland (21,000 m²), are all modern facilities which combine high tech equipment with a skilled, well trained workforce. All three sites produce both complete trailers alongside components for use in the assembly process.

Faymonville makes everything in house. Major investment in laser-cutting equipment means little waste of raw material. The same ethos applies to other parts of the process: welding is carried out automatically by robots where appropriate, or by skilled craftsmen. Their task is made easier by substantial lifting equipment, which both supports large structures and can turn them to any angle and height to ensure comfortable working. This capability includes suspending a complete trailer frame when required.

Faymonville offers the best surface protection system in the entire low loader sector: the MAXProtect+ treatment process. This multi-stage operation includes shot- and sand-blasting, and culminates in a metallisation process that coats all metal surface areas, including inside box sections, to create a corrosion resistant barrier between the metal and its primer and topcoat paint. Although this process obviously carries a price premium, it greatly

extends the life of paintwork for a decade or more – which might well be the entire working life for its first owner.

Faymonville produces around 2000 trailer units per year. In view of the special characteristics of the sold vehicles, repair assignments are often dealt with directly by Faymonville. This efficient round-the-clock service includes expert mechanics who are always on call. They go wherever help is needed at that particular moment. Faymonville also offers permanent telephone support, as it is often possible to find a 'remote' solution.

In addition to the company's own 24/7 breakdown service, Faymonville customers can also obtain professional maintenance and support services from regional qualified service partners. Qualified contacts guarantee immediate local assistance and they all provide the same services for Faymonville products while complying with the manufacturer's strict quality standards.

4. Strengthen of Faymonville

Modern facilities with high-tech equipment and a skilled, well trained workforce guarantees the best quality product on the market. Faymonville makes everything 100% in house which is the key of the highest quality. All the processes are subject to best quality standards.





Quality ... to the MAX! As example: the 8-coat protection of the chassis (MAXProtect+) included the metallization permits the best protection against corrosion available on the special trailer market.

Faymonville has a strong relationship with its customers and the aim is always to find the best solution for their specific demand. This customer-oriented flexibility and creativity to reach the optimal trailer solution are strengthen in the working process by Faymonville.

The complete service offered by Faymonville is much appreciated by our customers. It doesn't end after the sale of a trailer. In view of the special characteristics of the sold vehicles, repair assignments are often dealt directly by Faymonville. This efficient round-the-clock service includes expert mechanics who are always on call. They go wherever help is needed at that particular moment. Faymonville also offers permanent telephone support, as it is often possible to find a 'remote' solution.

5. International and global approach

Vehicles from Faymonville are doing transport jobs around the whole world: from Norway to South Africa, from Malaysia to Canada, from Germany to Australia.

In 2015, we have exported our trailers in 50 countries. Faymonville trailers are

transporting goods and materials in over 86 countries. In 2015, we have reached the highest export volume in Germany, France, Turkey and the United Kingdom. But we are always looking actively for new opportunities to distribute our high-tech products along new markets – for example in India!

A big challenge, where Faymonville puts all its strengthen inside. So we plan to implement our trailers in the Indian market and maybe to develop a partnership with a local dealer in the near future.

6. Projects for India

The products that Faymonville offers in India are specified to the national requirements. Faymonville keeps in any case its known and unique product quality!



About service: In view of the special characteristics of the sold vehicles, repair assignments are often dealt directly by Faymonville. This efficient round-the-clock service includes expert mechanics who are always on call. They go wherever help is needed at that particular moment. Faymonville also offers permanent telephone support, as it is often possible to find a 'remote' solution. It should be an aim to collaborate in the near future with a local service center.

We are thinking about to search in India a potential partner for a future collaboration for sales. Faymonville has the ideal products for the transport needs in India. We have modular trailers in our range from type ModulMAX. These modular vehicles can be coupled not only with each other (lengthwise and crosswise), but also with numerous transport fixtures (gooseneck, drawbar, turntables, hydraulically widening and extending vessel decks, flatbed decks from an overall height of 250 mm or telescopic excavator decks).

This variety of combination options as well as the user-friendly operating concept makes the ModulMAX a guarantor of flexibility and economy for the most complex of heavy-duty transport jobs. Apart from the compatibility with Faymonville PowerMAX SPMT transport modules, the ModulMAX offers seamless interoperability with identical vehicles from other manufacturers (S-ST, G-SL).

Faymonville is also specialist to manufacture wind blade trailers. This trailer type is called TeleMAX, a 2 to 6-axle flatbed semi-trailer, extendable by up to four times to 65 metres. Due to its extending loading platform, the TeleMAX flatbed semi-trailer is ideally suited for the transport of particularly long or bulky loads.

Its lightweight design, its greater steering angle and the low loading platform height additionally guarantees optimum manoeuvrability with the highest possible payload. The TeleMAX therefore fulfils all conditions for the time-efficient and cost-effective transportation of long or bulky goods for example; wind power plants or building structures.

And for Faymonville is it also an objective to implement in the near future its semi-trailers (MultiMAX) and low bed trailers (MegaMAX) in the Indian transport market.

Faymonville is always ambitious - ... to the MAX!!

Also in India, we put the highest possible objectives. First of all, we want a quick implementation of our trailer range in the market. So in medium term a growing number of selling units. And in longer term, it should be good to find maybe a local partner for sales and service.



Shortage of sustainable supply chain talent :

AN INDUSTRIAL TRAINING FRAMEWORK



Dr. Rameshwar Dubey

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Southern University of Science and
Technology, Shenzhen, China
Associate Professor (on sabbatical leave)
Symbiosis International University, Pune

Introduction

In sustainable supply chain has attracted burgeoning interest among scholars, practitioners and managers (Jabbour and de Sousa Jabbour, 2014; Gunasekaran and Spalanzani, 2012). In recent years corporates have embraced sustainability in their corporate strategy. However, the only question that put organizations in uncomfortable situation is lack of sustainable supply chain talent at junior level, middle level and senior level. The sustainability carries different meanings in literature (Squire, 1996); in such situation it is difficult to expect from supply chain managers to appreciate environmental and social perspectives across supply chain network. The rate at business is expected to grow in near future; the need for sustainable supply chain talent will be more. The skills required to manage sustainable supply chain network is completely different from the skills that was required in past to manage supply chain network where economic criteria was the only guiding principle. The complexity of the situation has attracted immense contributions from researchers (e.g. Jabbour and de Sousa Jabbour, 2014; Muja et al., 2014; Evans et al., 2009; Plaut, 2000; Agorastos et al., 1999). However, most of the research somehow focusses on need for training related to skill toward environmental supply chain network and management of carbon emissions across supply chain network. The sustainability in supply chain network is like a triangle which includes environmental perspective, social aspects and economic performance. Only focus on environmental supply chain may not alone guarantee sustainability of supply chain network and for this creating pool of talents having right

knowledge, skills and ability to respond to the future challenges of sustainable supply chain network, a training is must. In one of the study Mahler (2007), pointed out that only 40 percent of the surveyed firms, offer training related to sustainability. However, there is lack of mechanism to measure the impact of training on manager's attitude toward sustainability. Based on our preceding discussion we have outlined following objectives of our present paper are:

1. To identify skills for sustainable supply chain managers.
2. To develop to a training framework for sustainable supply chain managers.
3. To outline further research directions.

The rest of the paper is organized as follows. The next section, deals with sustainable supply chain skills. The third section deals with sustainable supply chain training framework and their building blocks. The fourth section deals with discussions based on sustainable supply chain training framework and its theoretical contributions, managerial implications, limitations and further research directions. Finally, we concluded our findings.

2. Sustainable supply chain skills

Before we proceed further, it is very important to understand the paradigm shift from profit driven supply chain network to triple bottom line (TBL) driven supply chain network. The concept of TBL can be traced from Spreckley (1981) work titled "Social audit – a management Tool for Co-operative Working". Since, the concept of TBL has been extensively used to measure sustainability. Traditionally a supply chain manager was sensitive toward

only economic criteria. Cottrill (2010), identified following skills for supply chain managers who can respond to the uncertain environment are hard and soft skills that includes ability to manage ambiguity, multi-level communicator and a global citizen. However, availability of all these skills in one individual is something like searching needle from haystack. However, as executives and consumers have started distinguishing market prices from social costs (Mahler, 2007), the skill required to respond to the emerging needs of the market, should be different from traditional supply chain managers. Today, managers need to be sensitive toward both external and internal pressures. In such situation a manager must possess innovative skills to implement sustainability in supply chain network (Mahler, 2007). Beside innovative skill a manager responding to sustainability pressing call must possess following traits such as sensitivity to the constantly changing environment, work without complaining or blaming, organize a system of environmental diligence, implement a strategy of environmental protection and development and recognize and develop a relationship between trade and the environment (Plaut, 2000). Jabbour and de Sousa Jabbour (2014) in one of their studies identified hard skills that are needed to respond to the environmental supply chain are knowledge of low carbon products, low carbon production and low carbon logistics. Though there are studies in past where traditional skills and non-traditional skills for supply chain and logistics managers were studied like (e.g. Ellinger and Ellinger, 2014; Goffnett et al., 2012; Esper et al., 2010; Handfield et al., 2011; Mangan et al., 2001; Murphy and Poist, 1998, 2006; Poist, 1984). However, in spite of huge literature focussing on logistics and supply chain skill, there is hardly any literature, with notable exceptions like (e.g. Jabbour, 2011, 2013; Jabbour and de Sousa Jabbour, 2014; Muja et al., 2014) which has reflected the skills required for managing sustainable supply chain. Even some studies, which have reported the skills for sustainable supply chain managers in their studies, there is hardly any training framework available which focusses on developing sustainable supply chain skills for managers. In our next section, we will discuss our framework

3. Sustainable supply chain skills and training framework

It is well understood that sustainable supply chains have major impact on environmental performance than any other activities. We have classified our literature based on sustainable supply chain skills as shown in Table I as follows.

3.1 Hard skills

In past research, the major focus was given to hard skills. It refers to technical competency a manager possess to discharge their duty efficiently and effectively. In order to be good sustainable supply chain manager, one must be able to respond to the recent pressing call of the external pressures that includes local government statutory and regulatory framework, customers' expectations and industrial houses demand. The managers must be tech savvy and capable to model complex problem which includes sustainability dimensions and derive optimal solutions. However, complex problem solving skill may not be sufficient if necessary soft skills are missing. Therefore hard skills combined with soft skills, definitely offer a competitive edge to managers who are implementing sustainability or managing sustainable supply chain network.

3.2 Soft skills

Cottrill (2010) argued in his article that how soft skills combined with hard skills can prepare manager to navigate through turbulent situation. The environment uncertainty is high and

pressure for striking balance between planet, people and profit is the pressing call of time. The 3Ps (Planet, People and Profit) are the pillars of a sustainable organization (Jabbour and de Sousa Jabbour, 2014). To deliver superior performance a manager with hard skills may not succeed. However, along with hard skills if managers are equipped with leadership, innovation, and effective communication skill the scenario will be much different.

We have attempted to identify sustainable supply chain skills. In this way we have attempted to address our first research objective.

3.3 Human resource development (HRD)

Ellinger and Ellinger (2014) outlined the role of human resource development intervention in creating sustainable supply chain talent pool through building necessary skills sustainable managers require through structured training. HRD has its root in human resource management (HRM) literature. In recent years the importance of HRD in SCM literature can be felt in a big way (e.g. Ellinger and Ellinger, 2014; Sweeney, 2013; Jabbour, 2011, 2013).

The HRD is a field of study and practice that seeks to create talent through creating ecosystem where right kind of knowledge is being imparted to build necessary skills and ability. The practice of borrowing HRM literature in supply chain management and operations management (SCM

Table I Classification of sustainable supply chain skills

Classification of sustainable supply chain skills	Skills	References
Hard skills	Knowledge about carbon footprints Knowledge about green production Understanding of Green Logistics Understand Green Sourcing Green Packaging Green Accounting Exposure to quantitative techniques Exposure to latest technology	Jabbour and de Sousa Jabbour (2014) Jabbour and de Sousa Jabbour (2014) Jabbour and de Sousa Jabbour (2014) Mahler (2007) Mahler (2007) Mahler (2007) Mahler (2007) Slone et al. (2007)
Soft skills	Sensitive to external and internal environment Multi-communicator Ability to work without complaining and blaming Leadership Teamwork Learning ability Global citizen	Paille ´ et al. (2014), Plaut (2000) Cottrill (2010) Jabbour (2013), Plaut (2000) Christopher (2012), Slone et al. (2007) Paille ´ et al. (2014), Tung et al. (2014), Jabbour (2011, 2013), Fisher et al. (2010) Tung et al. (2014), Jabbour (2011, 2013), Cottrill (2010) Cottrill (2010), Slone et al. (2007)

and OM) literature is not a new. However, although SCM performance is highly linked with human resource (HR) capabilities (Sweeney, 2013), organizations have largely neglected the human and behavioral components of SCM (e.g. Ellinger and Ellinger, 2014; Sweeney, 2013; Tokar, 2010).

3.4 HRD expertise and the development of sustainable supply chain manager skill sets

In most of the organizations, the HRD department responsibility to identify the needs for training and organize training program to improve knowledge and build necessary skills which are needed to address the sustainable supply chain skill gap issues (e.g. Ellinger and Ellinger, 2014; Swanson and Holton, 2005). HRD professionals’ intervention expertise would certainly help to improve soft skills of supply chain managers involved in managing complex sustainable supply chain network. In recent years the research conducted by leading scholars (e.g. Ellinger and Ellinger, 2014; Jabbour and de Sousa Jabbour, 2014; Sweeney, 2013; Jabbour, 2011; Tokar,

2010) have expressed the need for HRD interventions and develop a rigorous training program for building sustainable supply chain talent capability. In present scenario, there is hardly any such training program run by organizations which focusses on building sustainable supply chain talent. We will propose our training framework to address our one of the research objectives in our next sub-section.

3.5 Training framework for sustainable supply chain talent

The discussions which we have carried in preceding sections and inputs drawn from senior managers from leading organizations from India that includes CII Institute of Logistics (an apex body of Confederations of Indian Industries), National Skill Development Corporation, and some other leading sustainable organizations.

We have further presented our building blocks of our Figure 1 in Table II. In Table II we have further outlined the elements of our building blocks.

4. Discussions

4.1 Theoretical contributions

An attempt has been made to provide a conceptual training framework for sustainable supply chain talent as shown in Figure 1. In this we have attempted to address our second research objective. Our present study has tried to extend the previous scholarly works like (e.g. Jabbour and de Sousa Jabbour, 2014; Jabbour, 2011). Second, we also tried to classify the sustainable supply chain skills into two broad categories (i.e. hard skills and soft skills). In this way, we have tried to revisit the famous “BLM” framework of Poist (1984), where he has classified skills of logistic manager into three categories (i.e. B-Business Skills, L-Logistics Skills and M-Management Skills).

4.2 Managerial implications

The present study has made an effort to identify sustainable supply chain skill sets and kind of HRD interventions required to create sustainable supply chain talent pool. In this way, we have attempted to answer long pending research calls of various scholars and practitioners. We have outlined sustainable supply chain skills in Table I and

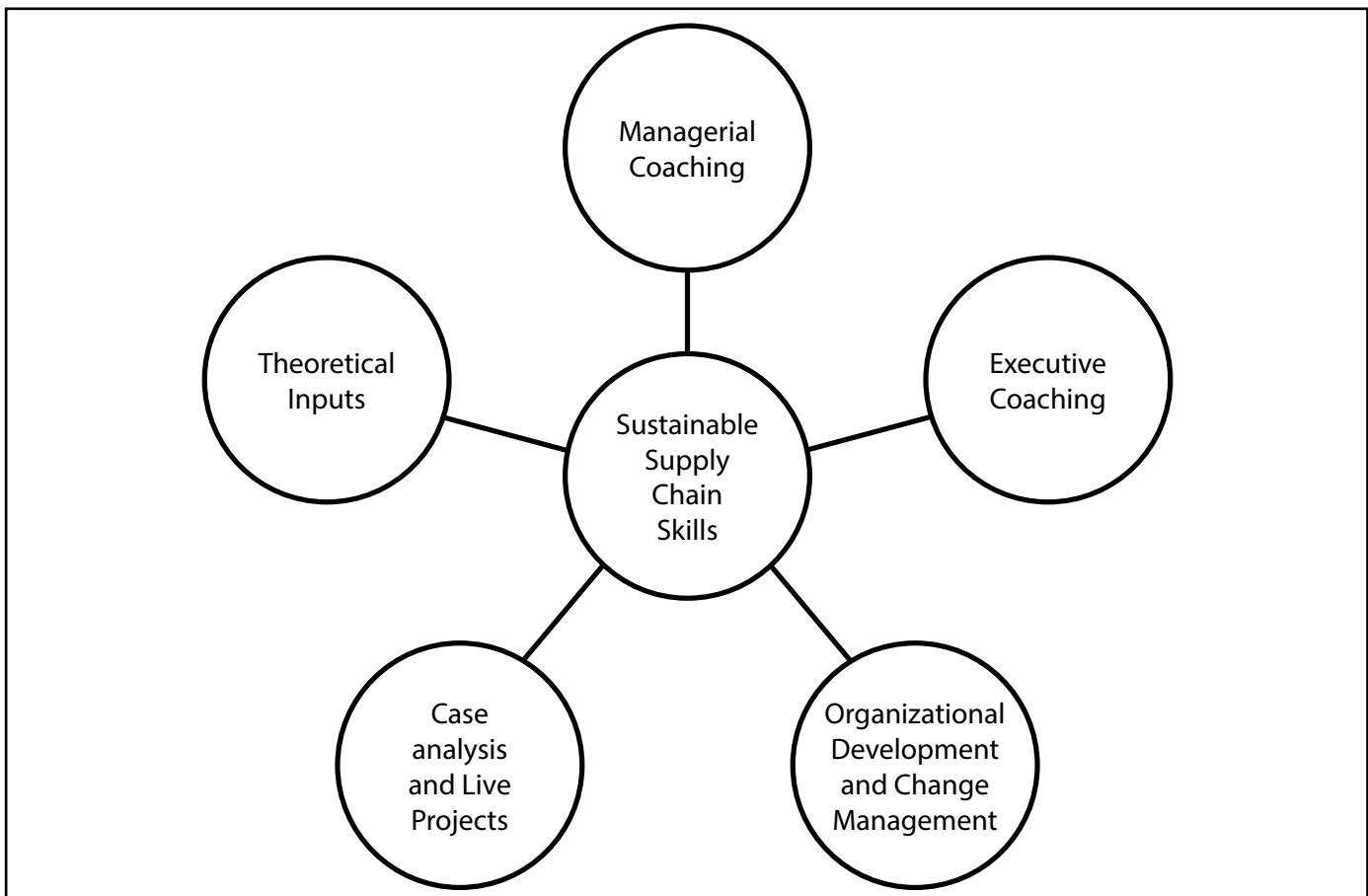
HRD interventions in Table II. This can be further used as Training-Skills matrix, by an organization.

4.3 Recommendations for creating sustainable supply chain talent pool

A number of recommendations can be made out of the present study. These recommendations would be insightful for creating a sustainable supply chain talent pool. These recommendations are as follows:

- Training must focus on both hard and soft skills for building sustainable supply chain skills. The supply chain managers must possess knowledge to appreciate environmental, social and economic dimensions. Moreover, a supply chain managers must possess desired soft skills which includes the leadership, effective communication and teamwork skills.
- A mentor and mentee model is very important aspect of training. It is recommended that a right mentor must be identified for group of mentee.

Figure 1 Training framework for sustainable supply chain talent



- The human resource policies and human resource intervention are pivotal to success of sustainable supply chain management training to their existing supply chain managers.
- The proper incentives and reward policies must be aligned with the performance of individual supply chain managers during training programs.
- The training must include inbound and outbound modules. The inbound module must include theoretical inputs covering fundamentals of supply

chain management, evolution of sustainable supply chain and fundamental differences between supply chain management and sustainable supply chain and necessary quantitative skills. To further supplement theoretical inputs, a rigorous case analysis, field project and public presentations will enhance skills of supply chain managers to respond to pressing call of sustainable supply chains. The outbound training are quite proven methodology to improve leadership, team work and effective communication skills.

Table II Building blocks of training framework for sustainable supply chain talent

Building blocks of sustainable supply chain talent	Elements	References
Sustainable supply chain skills	Hard Skills Knowledge about carbon products; Knowledge about green production; Knowledge about green logistics; Complex problem solving skills; Understanding of green packaging; Use of latest technology; Exposure to TBL framework Soft skills Leadership skills; Teamwork; Positive attitude; Learning ability; Excellent communication skill; Global citizen	Jabbour and de Sousa Jabbour (2014); Christopher (2012); Mahler (2007); Slone et al. (2007)
Managerial coaching	Trust in people abilities and potential; Commitment to nurturing and enabling employees; Passion for long term work performance; Belief in coaching as mutually beneficial; Self-innovativeness; Respect for diversity; Professionalism and expertise; Self-control and balance; Ethical values; Integrity; Caring; Authenticity; Questioning; Listening; Feedback; Acknowledgement and recognition; Sensitivity to others and environment;	Hamlin (2004)

Executive coaching	Goal setting; Collaborative problem solving; Practice; Supervisory problem solvings; Regular feedback; Evaluation of end results; Public presentations;	Olivero et al. (1997)
Organizational development and change management	Promote participation; Information sharing; Motivation; Empowerment;	Worren et al. (1999)
Case analysis and live projects	Unique case of successful implementation of sustainable practices of an organization; A case of an organization which has failed to successfully implement sustainable supply chain practices; A live project where a supply chain manager needs to demonstrate the assimilation of theory and its application in real life scenario; Project report writing skill;	Authors
Theoretical inputs	Fundamentals of supply chain and logistics management; Introduction to sustainable supply chain practices; Quantitative techniques; Supply Chain Simulation; Supply Chain Modeling; Reverse logistics; Environmental management; Leadership theory; Organizational Behavior; Operations Management; Quality Management;	Authors

5. Conclusions

Drawing broadly on our extensive literature review and expert discussions the sustainable supply chain skills matrix has been identified as shown in Table I. We further extended our discussion and proposed a conceptual training framework for sustainable supply chain talent.

We have identified HRD interventions and theoretical knowledge to provide rigorous training so that supply chain managers can embrace sustainability and can respond to the external pressures diligently. We have outlined our theoretical contributions of our study and further managerial insights. The limitations our present

study is that our proposed conceptual framework is derived on the basis of extant literature review and expert discussions. However, methodically this is not a sound approach and may attract criticism as it needs to be further investigated using survey data. Last, we have outlined further research directions based on our study findings.

5.1 Limitations

Like any study our present study has its own limitations. However, our limitations can be further explored which we will discuss in our next sub-section. We have developed our framework based on literature review

and expert opinions. However, this framework needs to be scientifically validated. Our present study thus needs to be investigated using survey data. Second, our present model does not include confounding variables. In fact when our model will be statistically validated the confounding variables need to be identified. Like many studies in past one may compromise with internal validity.

5.2 Future research directions

The present study offers multiple research opportunities. The further research opportunities are:

- The framework can be further tested using survey data;
- The measurement scale for sustainable supply chain training framework can be developed using scientific methodology;
- The present study can also be used for developing “sustainable supply chain skills-training” matrix;
- The effectiveness of HRD interventions on effectiveness of training from sustainable supply chain skills perspective can be further investigated;
- Finally, the study can also study the role of top management commitment toward creating sustainable supply chain talent pool, which is the pressing call of time.

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Ist Biennial Bridge Management System Conference



Sachin Joshi
IDDC

A bridge is a marvel of engineering representing mankind's victory over the topological challenges of the region. Every bridge has a story profoundly vested in the history of the region. Be it for war, peace or for just being able to easily commute from one place to another place, every bridge symbolises mankind's advancements in technology of the era. Why, then should such asset not garner the attention they deserve?

Historically, India Boasts of some of the oldest bridges in the world. However, due to lack of proper records, information is only available in 30 percent of all existing bridges in India. A system to record, monitor and maintain these great assets is the need of the hour. This is the premise of the Indian Bridge Management System (IBMS). A system built to maintain records on and monitor every bridge in the country developed by Asset Management Technologies the research wing of IDDC Engineers Pvt Ltd.

Recently the 1st biennial conference on IBMS, hosted by Asset Management Technologies was organised at the NDMC convention centre in Delhi. Shri Nitin Gadkari, Minister of Road Transport and Highways and shopping, inaugurated the event and launched Indian Bridge Management System.

This highly anticipated programme was conducted to "bridge" together the academia, public sector, non government organisation and private sector on various aspects related to the repair, rehabilitation, retrofitting or replacement of Indian bridges. The conference began with an inaugural speech by Shri Sachin Joshi Director and TL Indian Bridge Management System. In his speech, he iterated the lack of basic data on bridges in country. IBMS will provide the basic framework to evolve this data which can be used for management of bridge asset during its life span. He said, "Information on existing bridges would not only help us maintaining these assets to protect the bridges but also provide guidelines for upcoming projects."



The key note address was followed by the felicitation of all participating agencies, HTOA the Event supporter and one of the supporting organization, was felicitated. Sachin Joshi when announcing the same informed that audience that had it not been for HTOA, IBMS would not have been implemented. And now IBMS the largest single owner database in the world. Currently, the IBMS data base both information of over 1,23,000 bridges and culverts, pan India.

Following the facilitation, Director General and Special secretary, Shri S N Das took to the stage to give the audience his views on IBMS. In his speech, he mentioned the following :IBMS was established 2015 by the ministry of road transport and highways, Consultant were hired for conducting conditions survey on the bridges, Mobile bridge inspection units were set up to enable faster collection of data and all these data are being fed in to the IBMS system. The bridge management system the Indian bridge management system was conceptualised by Shri Sachin Joshi. It is being implemented through the ministry of Road Transport and Highways (MORTH) the systems aims to maintain records and data for bridges and culverts on all highways all over India. The Indian Bridge Management System works by giving each bridge a unique identity number this number is generated based on the state/region in which the bridge is in, its estimated



location, and the bridges engineering properties such as material, age, design etc.

The approximate longitudinal latitudinal details are obtained via GPS by units at the site.

A structural rating: using various non destructive testing method and the socio economic impact rating is also carried out for each bridge, and this data is also fed into the system in real time the structural rating , based on various parameters, indicate the condition of the bridge. IBMS assigned a rating from 0 to 9 to indicate this condition. 0 and 1 indicate bridge is closed or needs to be closed. Similarly, 2 to 9 indicates other grades given by certified engineers. This helps create an action report for bodies concern to prioritise repairs and rehabilitation work.

Excerpts of shri Nitin Gadkari address

In the minister's address to the delegates, Shri Gadkari expressed his concern about the lack of any database on bridges. He said, " the lack of any substantial database and bridges in India has led to a situation wherein maintaining them properly is becoming increasing the difficult." innovative, 'out of box ' thinking along with material segmentation is the need of the hour he further expressed.. on innovation and experimentation the Minister encouraged the delegates citing the groundbreaking strides achieved in precast also added that creating awareness amongst students form IITs and student from the civil disciplines through training planing programmes is essential to the sustained improvement and development of infrastructure. an important and vital point raised by Shri Gadkari was the construction of 'railways over bridges'. High GDP losses due to railway over bridge truck standing are hampering and economy according to him. He cited the example of Rajasthan and Maharashtra, who already

took the initiative in this regard by submitting more then 300 over bridges propose. Form a government point of view, Shri Gadkari assured the full support from Government of India stating that an amount of about 30,000 crores has been sanctioned for bridge repair activities. He further mention that all efforts to draft better taxation laws will be explored.

The IBMS Conference

Following shri Nitin Gadkari's address, Shri Sachin Joshi demonstrated the IBMS module on tablet to the Minister. The Minister than proceeded to announce the system to the audience an IBMS would launch with inauguration and launch completed, IBMS 2016 kick stared the technical sessions with in

excellent presentation on "the economic impacts of IBMS" by V.L Patankar.

The paper was part of first session , aimed at given the delegates an understanding of the impact the IBM system would have. In his presentation Shri Patankar mentioned that IBMS would lead to the birth of Bridge Rehab industry in our country. Patankar's presentation was followed up with presentation by Alok Pandey and Kamlesh Kumar.

The Rest of the day belonged to second session which aimed to through light and process involved with bridge management. Ms. Sapparv Bhattacharya (UK) Sachin Abhyankar,(USA) and Alok Bhomick and Ssitaram Sagi Raju. took the podium to enrich the delegates with the BMS process with delegates hailing from different sessions of the government the interactive session posed to be tricky one , with government officials raring to have their doubts and ides solved and shared. The second day of conference spanned out through 4 sessions viz.;Non destructive/ experimental testing of bridges, retro fitting, and panel discussion. Renowned speakers such as Shri Samir Surlaker, Shri Chetan Raikar, Dr. Rao Tatavarti, Shri Manjure, Shri Vinay Gupta presented topic ranging from chemicals for retro fitting to photonic technology for monitoring. With in active and engaged audience, the 1st biennial conference on bridge management was concluded on the 5th of October 2016. having launched IBMS; The app and portal, IBMS 2016 drove home the need of asset management in India. A grand success,asset management technologies has since announced IBMS 2018, 'the second biennial Conference at Hyderabad, in October 2018.

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2	Arunchal Pradesh	Secretary of Transport	"Transport Secretariat Govt. of Arunchal Pradesh"	Itanagar	360	2212457
3	Assam	"Transport Commissioner"	"Paribahan Bhawan, Jawahar Nagar, Khanapara"	Guwahati-22	361	2304110;2308525
4	Bihar	"Transport Commissioner"	"Vishwesaraiya Bhawan, Bailey Bhawan"	Patna	612	2546449
5	Chattisgarh	The Transport Commissioner	New Bus Terminal Complex, Pandari	Raipur	771	2582799/ 2582788/ 2221338
6	Goa	Secretary of Transport	"1st floor, Junta House, 18th June Road, Panaji"	GOA	832	"2225606, 2225724"
7	Gujrat	The Transport Commissioner	Block No.6, 2nd floor, Dr.Jivraj Mehta Bhawan, Old Sachivalaya	Gandhinagar	79	23251367
8	Haryana	The Transport Commissioner	30, Bays Building, Sector-17	Chandigarh	172	2784359
9	Himanchal Pradesh	The Transport Commissioner	"Directorate of Transport, Parivahan Bhawan, "	Shimla-171004	177	2803136;2808642
10	Jharkhand	The Transport Commissioner	Transport Bhawan	Ranchi	651	"2401706 9934345820"
11	Karnataka	The Transport Commissioner	"1st Floor, 'A' Block, TTMC Building, Shantinagar, Bangalore-560027"	Bangalore-560027	80	22214900
12	Kerala	The Transport Commissioner	"Motor Vehicles Department Trans Towers, Vazhuthacad,	Thiruvananthapuram	471	2333314; 8547639000
13	Madhya Pradesh	The Transport Commissioner	E7/446, Arera Colony	Bhopal	755	2424500
14	Maharashtra	The Transport Commissioner	3rd Floor, New Administrative Building, Near Dr.Ambedkar Garden, Government Colony, Bandra-East	Mumbai-400051	22	26516336
15	Meghalaya	Secretary of Transport	"Madanrting, Sawlad, Shillong - 793021"	Shillong-793021	364	2534617
16	Mizoram	Secretary of Transport	"State Trpt. Authority Mizoram Directorate Of Transport Bldg, Chaltlang Mst Transport Bldg Top Floor, Tuikual Aizawl, Aizawl H O"	Aizawl-796001	389	2318613
17	Nagaland	Secretary of Transport	"GOVERNMENT OF NAGALAND, Motor Vehicles Department, Transport Commissioner, Nagaland, Kohima-797 001"	Kohima-797001	370	2290409
18	Odisha	The Transport Commissioner	6th Floor, Rajaswa Bhawan	Cuttack-753002		
19	Rajasthan	The Transport Commissioner	"Transport Deporment Parivahan Bhawan, Sahkar Marg, Jaipur-302 005 (Rajasthan)"	Jaipur-302005	141	2740021; 5194600
20	Tamil Nadu	The Transport Commissioner	Ezhilagam, Chepauk,	Chennai	44	28588989
21	Telangana	The Transport Commissioner	Dr.B.R.Ambedkar Transport Bhawan, RTA Campus, Somajiguda,	Hyderabad-500082	40	23321282
22	Uttar Pradesh	The Transport Commissioner	Tehri Kothi, M.G.Marg	Lucknow-226001	522	2613978
23	Uttarakhand	The Transport Commissioner	Kulhan, Sahasthradhara Road	Haridwar-248001	135	2711227
24	West Bengal	The Addl. Chief Secretary- Transport	Writer's Building	Kolkatta-700001	33	22625411

National Highway Authority of India

Project Implementation Units

S.N.	State	Location	Authority	Address	Phone
1	Andhra Pradesh	Anantapur	The Project Director, National Highway Authority of India,	House No.6-4-239, 3rd Cross, Maruthi Nagar Anantpur-515001	08554-275599
2	Andhra Pradesh	Hyderabad	The Project Director, National Highway Authority of India,	Dr. No.331/2RT, 2nd Floor, P. S. Nagar, Masab Tank, Hyderabad-500057	040-23372666
3	Andhra Pradesh	Nandyal	The Project Director, National Highway Authority of India,	D.No.25/684/150, 1st Floor, Near Indore Stadium, Padmavathi Nagar, Nandyal-518501, Kurnool District, Andhra Pradesh	08154-225089
4	Andhra Pradesh	Nellore	The Project Director, National Highway Authority of India,	Bypass Road Junction with old GNTRoad, Vedayapalem, Nellore-524004, Andhra Pradesh	0861-2307733
5	Andhra Pradesh	Nirmal	The Project Director, National Highway Authority of India,	#1-3-594, Road No. 6 Shastrynagar, Distt. Adilabad Nirmal-504106	08734-241365
6	Andhra Pradesh	Rajamundry	The Project Director, National Highway Authority of India,	D. No. 78-14-21, Shyamala Nagar Rajamundry-533103	0883-2431170
7	Andhra Pradesh	Vijayawada	The Project Director, National Highway Authority of India,	Flat No. 21, Teachers Colony, (Above SBH), Vijayawada-520008	0866-2483910
8	Andhra Pradesh	Vishakapatnam	The Project Director, National Highway Authority of India,	(GQ) NHAI Enclave, Km 2/8, Hanumanthavaka, Visakapatnam-530040	0891-2707600
9	Andhra Pradesh	Vishakapatnam	The Project Director, National Highway Authority of India,	(Port Connectivity),Sheela Nagar,BHPV (P.O.) ,Visakapatnam-530012(A.P.)	0891-2707275
10	Assam	Bongaigaon	The Project Director, National Highway Authority of India,	Dolaigaon (Near Police Reserve) Bongaigaon-783380 Assam	03664-237493
11	Assam	Silchar	The Project Director, National Highway Authority of India,	H.No.328, 1st Floor, College Road, Ambicapatty, Silchar-788 004	03824-267213
12	Assam	Guwahati	The Project Director, National Highway Authority of India,	House No.1,1st Floor,Dilip Huzuri Path,Near Bageswari Mandir, Sorumotoria ,Dispur Guwahati-781006,Assam	0361-2233207
13	Assam	Nangaon	The Project Director, National Highway Authority of India,	Sankar Mission Road, Panigaon 1st Floor, Opposite to I.T.I. Nagaon Pin Code: 782003, Assam	03672-236701
14	Bihar	Begusarai	The Project Director, National Highway Authority of India,	At-Harpur, P.O.-Tilrath, Dist-Begusarai-851 122	06243-245144
15	Bihar	Muzaffarpur	The Project Director, National Highway Authority of India,	Sharma Sadan(3rd Floor),Opp D.A.V. School Khabra, Khabra NH-28,Muzaffarpur-843146	0621-2251934
16	Bihar	Patna	The Project Director, National Highway Authority of India,	D-63 Sri Krishna Puri, PATNA -800 001, Bihar	0612-2540184
17	Bihar	Darbhanga	The Project Director, National Highway Authority of India,	House of Mr. S.N. Mishra Diggi West, Professor's Colony Ward No. 10, Darbhanga (Bihar)-846004	06272-250194
18	Bihar	Purnia	The Project Director, National Highway Authority of India,	House of Shri. Sikkandar Singh, Sahiban Hata, Mahananda Colony, Near Janta Chowk , Purnia-85431	06454-243756
19	Bihar	Hajipur	The Project Director, National Highway Authority of India,	Sharma House, 2nd floor, Ramashish Chowk, Hajipur-844101	06224-274255
20	Bihar	Gaya	The Project Director, National Highway Authority of India,	House No. 70/244, West Jagjiwan Road,Opp.Judicila Quarters, Chanakyapuri Colony, Gaya-823001	
21	Bihar[70]/	Dhanbad	The Project Director, National Highway Authority of India,	Project Director - National Highways Authority of India, PIU Dhanbad, NHAI Complex, P.O. Bhitia, P.S. Govindpur, Distt. Dhanbad, Jharkhand	06540-283090
22	Chattisgarh	Raipur	The Project Director, National Highway Authority of India,	Project Director National Highways Authority of India House No.-A-7, VIP Estate Shankar Nagar, Raipur-492001, Chhattisgarh	0771-2282358
23	Goa	Goa	The Project Director, National Highway Authority of India,	Nr.Dr.Babasaheb Ambedkar Vocational Centre, Old Primary Health Centre, MPT, Headland, SADA, Goa-403804	0832-2521517
24	Gujarat	Gandhidham	The Project Director, National Highway Authority of India,	Z-6, Ground Floor, Near Divine Life Society Hospital (Sterling), Adipur, Dist-Kutch-370 205	0283-6260104
25	Gujarat	Ahmedabad	The Project Director, National Highway Authority of India,	Bungalow No., 3A & 3B, Amul Building, Amrut Baug Society, Near Dena Bank, Vejalpur Road, Jivraj Park, Ahmedabad-380051	079-26821062
26	Gujarat	Rajkot	The Project Director, National Highway Authority of India,	301-303, Krishna-Con-Arch-I,Plot No.9, Nr.Kotecha Chowk, University Road, Rajkot-360007	0281-2585193

S.N.	State	Location	Authority	Address	Phone
27	Gujarat	Surat	The Project Director, National Highway Authority of India,	Laxmi Bunglow No.4, B/H. Big Bazar, Nr. S.D. Jain School, Vesu - Piplod Road, Surat-395007	0261-2221223
28	Haryana	Rohtak	The Project Director, National Highway Authority of India,	Project Director National Highways Authority of India 305 Vidyanketan Road 1st Floor Model Town Rohtak-124001	01262-212010
29	Haryana	Ambala	The Project Director, National Highway Authority of India,	Project Director – CMU National Highways Authority of India 17L Model Town Ambala City – 134003	0171-2521361, 2520280
30	Haryana	Gurgaon	The Project Director, National Highway Authority of India,	Project Director Project Implementation Unit National Highways Authority of India, Dundahera, Delhi-Gurgaon Border Km.24 Mile Stone,NH-8,Gurgaon-122001	0124-2438056
31	Haryana	Faridabad	The Project Director, National Highway Authority of India,	6P, Sector-16A, Faridabad-121001	Telefax: 0129-2400900
32	Himanchal Pradesh	Shimla	The Project Director, National Highway Authority of India,	Kamna View Bhawan, Phase-III, Shimla-171009	0177-2673819
33	Jammu Kashmir	Srinagar	The Project Director, National Highway Authority of India,	Bashir Ahmad Parray, Opposite Jee Enn Sons, Airport Road, Parray Pora, Srinagar-190005	0194-2430728
34	Jammu Kashmir	Jammu	The Project Director, National Highway Authority of India,	Amar Villa House No.315;Sector No.1(1st floor) Channi, Himat Jammu-180015	0191-2473363
35	Jharkhand	Ranchi	The Project Director, National Highway Authority of India,	B-402, Road No. 4-C,Ashok Nagar, Ranchi-834002	0651-2245293
36	Karnataka	Dharwad	The Project Director, National Highway Authority of India,	2nd Cross, Sattur Colony Vidyagiri, Dharwad –580004	0836-2461244
37	Karnataka	Bangalore	The Project Director, National Highway Authority of India,	Survey No.13. Nagasandra Village, 14th Km. Bangalore-Tumkur Road, Hesaragatta, Bangalore – 73	080-28394383
38	Karnataka	Mangalore	The Project Director, National Highway Authority of India,	House No.7-35/10(4),Near Pumpwell,Mahaligeswara Temple Road,Kankanady,Mangalore-575002	0824-4254499
39	Karnataka	Chitradurga	The Project Director, National Highway Authority of India,	Project Director National Highways Authority of India Near J.M.I.T. Campus, NH-4 (Km 201) Chitradurga-577502	08194-223344
40	Karnataka	Hospet	The Project Director, National Highway Authority of India,	C-10,"Shree Nilayam" 1st Main,2nd Cross, Vivekanand Nagar, Nr.RTO office, Hospet-583203	08394-231565
41	Karnataka	Gulbarga	The Project Director, National Highway Authority of India,	Plot No. 65, Kothari Layout, Venkatesh Nagar, Gulbarga - 585103	08472 - 253756
42	Kerala	Palakkad	The Project Director, National Highway Authority of India,	No. 8/1187, Arumughan Colony,Chandranagar, Palakkad-678007	0491-2573790
43	Kerala	Kozhikode	The Project Director, National Highway Authority of India,	No. 2/2175-B, Krishna Kripa,Aishwarya Road, Civil Station(Post), Kozikhode-673020	0495-2376818
44	Kerala	Cochin	The Project Director, National Highway Authority of India,	Tharakans", 1st Floor, Near ICCI Bank Kalamasserri Ernakulam, Pin No. 682 104	0484-2559416
45	Kerala	Thiruvananthapuram	The Project Director, National Highway Authority of India,	TC .29/1539/1 Rajasree, Perumthanni, Vallakadavu (Post), Thiruvananthapuram-695 008,	0471-2460924
46	Madhya Pradesh	Guna	The Project Director, National Highway Authority of India,	Plot No.1, Phulwari Colony, Near Millennium School, Guna (M.P)-473001	07542-268051
47	Madhya Pradesh	Gwalior	The Project Director, National Highway Authority of India,	House No. 13, Vivekanand Colony Saraswati Nagar University Road, Gwalior-474011 (MP)	0751-2233116
48	Madhya Pradesh	Indore	The Project Director, National Highway Authority of India,	15, Sampat Hills,Opp. Sahara City, Indore- Dewas Bypass Bicholi Mardana Indore(M.P)-452 016	0731-2901666
49	Madhya Pradesh	Sagar	The Project Director, National Highway Authority of India,	67, Shivaji Ward, Poddar Colony Sagar Madhya Pradesh-470002	07582-236412
50	Madhya Pradesh	Narsinghpur	The Project Director, National Highway Authority of India,	1st floor, Near Paras Industries Tilak Ward, BargiColony Road Narsinghpur(Madhya Pradesh) -487001	07792-230330
51	Madhya Pradesh	Shivpuri	The Project Director, National Highway Authority of India,	Narendra Nagar, Chhatri Road (Near Jain Atta Chakki), Shivpuri-473551	07492-223902
52	Madhya Pradesh	Bhopal	The Project Director, National Highway Authority of India,	Plot No. A # 43, Sakshi Bunglow, Trilanga,Shahpura, Bhopal-462039	0755-2902448
53	Madhya Pradesh	Jabalpur	The Project Director, National Highway Authority of India,	Near jain Multispecialty Dental Clinic,Plot no. 13BB, Ahimsa Chowk, Vilaynagar, Jabalpur-482002	0761-4047042

S.N.	State	Location	Authority	Address	Phone
54	Madhya Pradesh[405] / Maharashtra[13]	Chindwara	The Project Director, National Highway Authority of India,	House No-84, Beside Polythene Factory, Swarna Jayanti Nagar, Near Friends Colony, Khajri Road, Chhindwara- 480001	07162-238120
55	Maharashtra	Nashik	The Project Director, National Highway Authority of India,	"Subodh House", S. No. 911/2, Plot No. 4, Behind Toyota Showroom, Off. Mumbai Agra Highway, Nashik 422 009 (Maharashtra).	0253-2372800
56	Maharashtra	Nagpur	The Project Director, National Highway Authority of India,	Bungalow No.2, Shubankar Apartments Plot No.159, Ambazari Hill Top Area, Ram Nagar Nagpur – 440 010	0712-2249316
57	Maharashtra	Pune	The Project Director, National Highway Authority of India,	S. No. 134/1, BAIF Bhavan Campus Dr. Manibhai Desai Nagar Above Bank of India (Warje Br.) NH-4, Wajre, Pune 411052	020-25231745
58	Maharashtra	Solapur	The Project Director, National Highway Authority of India,	Plot No. 80, Old Santosh Nagar, In front of Devika Gas Agency. Jule Sholapur, -413003 (MH)	0217-2303379
59	Maharashtra	Dhule	The Project Director, National Highway Authority of India,	S. No. 10/2, Plot No.11, Mansaram Nagar, Near Circuit House, Sakri Road, Dhule-424002	02562-276276
60	Maharashtra	Amravati	The Project Director, National Highway Authority of India,	"Matruchhaya" Plot No.33, Raguvir Co-op Housing Society, Opp Bank of Maharashtra, Badnera Road, Sai Nagar, Amravati – 444 607 Tele./Fax. 0721 – 2510035	0721-2510035
61	Maharashtra	Panvel	The Project Director, National Highway Authority of India,	SURVEY NO. 63, 'D' POINT ON NH-4B, CHINCHPADA KALAMBOLI BYPASS ROAD, PANVEL - 410 206	022-65140560
62	Maharashtra	Aurangabad	The Project Director, National Highway Authority of India,	B-23, Near Kamgar Chowk, N-3, CIDCO, Aurangabad-431003	0240-2481592
63	Meghalaya	Shilong	The Project Director, National Highway Authority of India,	PWD, Easter Circle Building Top Floor, Lower Lachumiere Shillong – 793003, (Meghalaya)	0364-2505177
64	Odisha	Keonjhar	The Project Director, National Highway Authority of India,	Plot No. 19/419, Badedera, Mandua, Keonjhar – 758001. Odisha	06766-253295
65	Odisha	Bhubaneswar	The Project Director, National Highway Authority of India,	1st Floor, Setu Bhawan, Nayapalli Unit-VIII, Bhubaneswar-751012	0674-2392720
66	Odisha	Berhampur	The Project Director, National Highway Authority of India,	Surya Nivas, Sales Tax Square, Engineering School Road, Berhampur-760010-Odisha	0680-2291796
67	Odisha	Sambalpur	The Project Director, National Highway Authority of India,	Bhatra, Opp. Poddar Petrol Pump, Dhanupalli, Sambalpur, Odisha 768005	0663-2546066
68	Punjab	Chandigarh	The Project Director, National Highway Authority of India,	Bay No 35-38, Ground Floor, Sector -4, Panchkula	0172-2587446
69	Punjab	Jalandhar	The Project Director, National Highway Authority of India,	135, Guru Amardas Nagar, Near Verka Milk Plant, Jalandhar Bypass Jalandhar	0181-2603642
70	Rajasthan	Kota	The Project Director, National Highway Authority of India,	A 575, Talwandi KOTA (Rajasthan)-324005	0744-2433396
71	Rajasthan	Udaipur	The Project Director, National Highway Authority of India,	10-A, New Panchwati Udaipur- 313001	0294-2428094
72	Rajasthan	Bhilwara	The Project Director, National Highway Authority of India,	Project Director, PIU, Bhilwara,6-A-1, R.C. Vyas Colony, Bhilwara-311001(Raj.)	01482-230611
73	Rajasthan	Dausa	The Project Director, National Highway Authority of India,	87,Ganga Vihar Colony,Behind Rawat Palace Hotel Dausa-303303, Rajasthan	1427224918
74	Rajasthan	Chittorgarh	The Project Director, National Highway Authority of India,	59-B, Babu Nagar, West Road No. 5, Senthii Chittorgarh, Raj-312001	01472-246474
75	Rajasthan	Jaipur	The Project Director, National Highway Authority of India,	156, Girnar Colony, Near Laxmi Marriage Garden, Vaisali Nagar, Jaipur	0141-4026465
76	Rajasthan	Reengus	The Project Director, National Highway Authority of India,	Sangeeta Travels, Ward No. 20, Near Toll Booth, NH-11, Reengus -332404,Rajasthan	01575-224090
77	Haryana	Hisar	The Project Director, National Highway Authority of India,	H.No. S-17, Near Mezbaan Hotel, Model Town, Hisar Haryana Pin 125005	01662-248273
78	Rajasthan	Pali	The Project Director, National Highway Authority of India,	27, Tagore Nagar, Near Circuit House, Pali (Raj.)	02932-263556
79	Rajasthan	Jodhpur	The Project Director, National Highway Authority of India,	148 UMAID HERITAGE Ratanada, Jodhpur-342006 (Rajasthan)	
80	Rajasthan	Ajmer	The Project Director, National Highway Authority of India,	Plot No. 111, Grah Nirman Sahakari Samiti Ltd., Adarsh Nagar, Ajmer, Rajasthan 305001	0145-2680571
81	Tamil Nadu	Krishangiri	The Project Director, National Highway Authority of India,	Door No.259/1, Salem Main Road,Near KAKC Petrol Bunk, Krishnagiri – 635 001,	04343-234250

S.N.	State	Location	Authority	Address	Phone
82	Tamil Nadu	Karaikudi	The Project Director, National Highway Authority of India,	No.1, Second Floor, Subramaniapuram,3rd Street, Karaikudi-630002	04565-230707
83	Tamil Nadu	Tirunelveli	The Project Director, National Highway Authority of India,	Plot No.A-21, Thomas Nilayam, St. Thomas Road, Thendral Nagar, Maharaja Nagar, P.O. - Tirunelveli- 627 011,	0462-2522591
84	Tamil Nadu	Karur	The Project Director, National Highway Authority of India,	No.7 Kamadhenu Nagar, Karur-639001	04324-223670
85	Tamil Nadu	Thanjavur	The Project Director, National Highway Authority of India,	No. 54,First Floor,Natarajapuram Colony,Medical College Road, Thanjavur-613004	04362-246473
86	Tamil Nadu	Salem	The Project Director, National Highway Authority of India,	19/2B, Junction Road , Salem-636004	0427-2444275
87	Tamil Nadu	Chennai	The Project Director, National Highway Authority of India,	No. 1/54 - 28, Butt Road, St.Thomas Mount,Near Kathipara Junction, chennai-600016	044-22331795
88	Tamil Nadu	Coimbatore	The Project Director, National Highway Authority of India,	Door No.9/9A, 4th Cross Street, Kothari Layout, B.R. Nagar, (Opp. Coimbatore Stock Exchange) ,Trichy Road, Coimbatore-641005	0422-2324734
89	Tamil Nadu		The Project Director, National Highway Authority of India,	Door No. 13, Travellers Bungalow Road, Kamaraj Nagar, 1st Street, Valliyoor - 627 117, Tirunelveli District, Tamil Nadu.	04637-222985
90	Tamil Nadu	Villupuram	The Project Director, National Highway Authority of India,	10, Govindasamy Nagar,Behind Collectorate, Villupuram-605602	04146-251247
91	Tamil Nadu	Madurai	The Project Director, National Highway Authority of India,	No.83/1, SBI First Colony extension,Near Hotel Gowri Krishna,,Byepass Road, Madurai - 625016	0452-2387750
92	Tamil Nadu	Trichy	The Project Director, National Highway Authority of India,	New No.6, Old No. 44, 1st Floor, 3rd Main Raod, Ponnagar, Tiruchirappalli-620001, Tamil Nadu	0431-2482959
93	Uttar Pradesh	Moradabad	The Project Director, National Highway Authority of India,	3-C/446, Budhi Vihar , Behind Springfield College, Delhi Road, Moradabad-244001	0591-2480070
94	Uttar Pradesh	Agra	The Project Director, National Highway Authority of India,	A-208, Kamla Nagar Agra-282005	0562-2580274
95	Uttar Pradesh	Varanasi	The Project Director, National Highway Authority of India,	S-8/108 DIG Colony, Maqbool Alam Road, Varanasi -220 001	0542-2501003
96	Uttar Pradesh	Aligarh	The Project Director, National Highway Authority of India,	C 47 and 48, Dream City, Bal Jiwan Ghutti, GT Road, Salsor, Aligarh-202001	0571-2900697
97	Uttar Pradesh	Raibareilly	The Project Director, National Highway Authority of India,	House no. 784, Vishnu Nagar, Opp Satyam Hospital, Raebareilly (UP)-229001.	0535-2702526
98	Uttar Pradesh	Allahabad	The Project Director, National Highway Authority of India,	18-C/28A, Sarojini Naidu Marg, Civil Lines, Allahabad-211001	0532-2422035
99	Uttar Pradesh	Kanpur	The Project Director, National Highway Authority of India,	53, Basant Vihar, Naubasta, Kanpur-208021	0512-2630154
100	Uttar Pradesh	Lucknow	The Project Director, National Highway Authority of India,	1/73G, Vineet Khand, Gomti Nagar Lucknow - 226 010 (UP)	0522-2726167
101	Uttar Pradesh	Gorakhpur	The Project Director, National Highway Authority of India,	No-3/40 Bahar, Cluster-3, Sahara State, Gorakhpur-273010 (U.P.)	0551-2231040
102	Uttar Pradesh	Bareilly	The Project Director, National Highway Authority of India,	26, Green Park, Beesalpur Road, Bareilly-243006(UP)	0581-2523752
103	Uttar Pradesh	Meerut	The Project Director, National Highway Authority of India,	B-88, European Estate Colony, Near Best Price, Kankarkheda,	0121-2959090
104	Uttar Pradesh	Ghaziabad	The Project Director, National Highway Authority of India,	R-7/6 Raj Nagar Ghaziabad,Distt- Ghaziabad(UP)-201002	0120-2822406
105	Uttar Pradesh	Jhansi	The Project Director, National Highway Authority of India,	Jhansi House No. 214/1, K. K. Puri, Near Shiv Temple,Jhansi 248003	0510-2450967
106	Uttarakhand	Dehradun	The Project Director, National Highway Authority of India,	House No-5, Lane-4, Sector-4, Teg Bahadur Road, Dehradun	0135-2669562
107	Uttarakhand	Rudrapur	The Project Director, National Highway Authority of India,	A-35, Green Park, Kashipur Road	-
108	West Bengal	Kolkata	The Project Director, National Highway Authority of India,	" White House", 119, Park Street, Block -A, 2nd floor, Kolkata-700017	033-22268131
109	West Bengal	Siliguri	The Project Director, National Highway Authority of India,	Sevoke Road, 2½ Mile, Jyotinagar Near Don Bosco School Siliguri 734001 (WB)	0353-2540564
110	West Bengal	Krishnagar	The Project Director, National Highway Authority of India,	Vill.+P.O. - Bhatjangla, Krishnagar, Dist. - Nadia, PIN-741101 (WB)	03472-271713
111	West Bengal	Durgapur	The Project Director, National Highway Authority of India,	NHAI Complex, Sector 2(A) Bidhan Nagar, Durgapur-713212	0343-2535766
112	West Bengal	Kharagpur	The Project Director, National Highway Authority of India,	NHAI Complex, Near Chaurangi, P.O. Inda, Kharagpur - 721305	03222-227682
113	West Bengal	Malda	The Project Director, National Highway Authority of India,	UCO Bank Building 2nd Floor Mangalbari (NH-34) Mangalbari Pin-732142 Malda	03512-260630

MINISTRY OF ROAD, TRANSPORT & HIGHWAYS REGIONAL OFFICES IN INDIA

S.N.	Location	Authority	Address	City	STD Code	Phone	Fax
1	Gandhinagar	Superintending Engineer, Department of Road Transport & Highways	Block No. 14, 4th Floor, New Sachivalaya	Gandhinagar-382010	79	23240091	23220705
2	Bhopal	Superintending Engineer, Department of Road Transport & Highways	1st Floor, D-Wing, Satpura Bhawan,	Bhopal-462004	755	2551329	2551329
3	Thiruvananthapuram	Superintending Engineer (Civil), Department of Road Transport & Highways	Public Office Building,	Thiruvananthapuram – 695033	471	2320879	2320991
4	Lucknow	Superintending Engineer (Civil), Department of Road Transport & Highways	NH Bhawan, Bio Tech Chowk, Ring Road, Vikas Nagar	Lucknow-226022	522	2322741	2321446
5	Jaipur	Superintending Engineer (Civil), Department of Road Transport & Highways	opp.D.C.M., Ajmer Road, P.O. Shyam Nagar,	Jaipur – 302019	141	2811883	2811776
6	Kolkata	Superintending Engineer (Civil), Department of Road Transport & Highways	Room No.106, Block-C (1st Floor), Central Govt. Office Complex, C Wing DG Block, Salt Lake,	Kolkata-700064	33	23586942	
7	Chandigarh	Superintending Engineer, Department of Road Transport & Highways	6th Floor, Kendriya Sadan, Sector-9A,	Chandigarh-160017	172	2740376	2740376
8	Bhubaneswar	Superintending Engineer, Department of Road Transport & Highways	Plot No.184 in front of CRPF Stadium Baramunda,	Bhubaneswar-751003	674	2564260	2564260
9	Guwahati	Superintending Engineer(Civil), Department of Road Transport & Highways	Rajgarh Road, Chandmari	Guwahati-781003	361	2540552	2540552
10	Mumbai	Superintending Engineer, Department of Road Transport & Highways	95, New Admn. Building No.2, Ground Floor, PWD Compound, R.C.Marg, Chembur	Mumbai-400071	22	25294858	25294858
11	Patna	Superintending Engineer, Department of Road Transport & Highways	17, Aniket Cooperative Housing Society, IAS Colony, Colony, Kidwaiपुरी (S.K. Nagar),	Patna-800001	612	2260471	2260471
12	Bangalore	Superintending Engineer (Civil), D/o Road Transport & Highways,	PWD Office, Annexe Building, K.R. Circle,	Bangalore-560001	80	22217457	22212765
13	Dehradun	Office of Engineer Liaison Officer, C/o Chief Engineer (Level-I), D/O Road, transport & Highways	Uttaranchal PWD, Dehradun – 248001	Dehradun-248001	135	2531125	2531125
14	Hyderabad	Superintending Engineer, C/o Chief Engineer(NH) Building, D/O Road, Transport & Highways	2nd Floor, Quality Control Bldg., Errum Manjil,	Hyderabad-500082	40	23393206	23393206
15	Chennai	Superintending Engineer, Department of Road Transport & Highways	C-1-A, Rajaji Bhawan, Besant Nagar,	Chennai-600090	44	24912115	24912115
16	Raipur	Superintending Engineer, Department of Road Transport & Highways	Pension Bada, NH campus	Raipur(Chattisgarh)-492001	771	2429786	2429786
17	Ranchi	Superintending Engineer, Department of Road Transport & Highways	New Area, Dutta Villa Road, Near TMC, Morabadi, House No.18F	Ranchi-834008	651	2403879	
18	Itanagar	Superintending Engineer, Department of Road Transport & Highways	1st Floor, Campus of CE(WZ) , NoWB,	Itanagar-791111 Arunachal Pradesh		9766321693	

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To know more about the new Volvo FH & the new Volvo FM visit www.volvotrucksindia.com or write to us at vtimarketing@volvo.in

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