Plan and Implementation Support for Commercialization of NW-1

Summary of 5th Pilot Movement

Kahalgaon to Kolaghat / DALMIA

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1 Introduction

In India the National Government intends to increase the use of IWT and to exploit the potential that this mode of transport offers for the country's growing economy. During recent years, the National Government and the Inland Waterways Authority of India (IWAI) as the statutory authority in charge of inland waterways have therefore undertaken major efforts to enhance the navigability and boost freight movements on India's inland waterways.

Given the country's recent economic growth, India's road and rail networks are overloaded in many places and transportation of cargo and passengers suffers from heavy congestion and the presence of physical bottlenecks. Moreover increasing pollution and environmental goals require a comprehensive and coordinated approach to a national transportation policy. Recognizing its mode specific advantages and given the country's large network of rivers, canals and backwaters, the Indian Government intends to make IWT an integral part of the country's future transport system.

In order to foster a sustainable and commercially viable future development of the sector, the competent authorities have invited external expertise for a project on Plan and Implementation Support for the Commercialization of National Waterway-1 (NW-1). The project thereby aims to facilitate actual business development and to stimulate the further development of freight movements on India's longest National Waterway from Allahabad to Sagar Island.

Having been awarded the contract to conduct the assignment, a Joint Venture of HPC Hamburg Port Consulting GmbH, UNICONSULT Universal Transport Consulting GmbH and its local Partner La Mer Maritime Ltd. have put together a team of experts with comprehensive and long-standing knowledge of both, international IWT markets in general and the Indian inland waterway shipping sector in particular. In the course of the ongoing project work, the Consultants' experts engage into one to one interaction with relevant market stakeholders, aiming at the conduct of Pilot Movements and the closing of actual working contracts.

Considering the practical experiences and also building upon the interim findings of the current project's ongoing field work as well as the Consultant's profound knowledge of the Indian IWT market, this summary of the fifth Pilot Movement provides implementation-oriented recommendations for creating the necessary conditions for a sustainable development of IWT transports on NW-1.

In the following, Chapter 2 gives an overview of the general background of this specific Pilot Movement of fly ash from Kahalgaon, Bihar to Kolaghat, West Bengal and the efforts done to initiate it. Chapter 3 presents the financial issues while Chapter 4 provides details on the operational aspects. Based on the findings, crucial success factors and relevant requirements for commercially viable transports and their technical feasibility are discussed in Chapter 5. Chapter 6 gives recommendations on urgent need for action.

2 Preparation of Pilot Movement

Acknowledging the public efforts to increase operational reliability and economic efficiency of inland waterway shipping on NW-1, Dalmia Baharat Cement Ltd. (Dalmia) has repeatedly demonstrated interest in the chances and benefits that IWT-based transport solutions could potentially offer with regard to the company's specific logistics requirements. As the cement branch of the Dalmia Group the firm runs a number of manufacturing plants in the states of Tamil Nadu and Andhra Pradesh. Moreover the company also holds a 74 % stake in OCL India Ltd. and has invested in Adhunik Cement & Calcom Cement.

Over the first few months of the ongoing project on Commercialization of NW-1, the Consultant's team of experts has established good contact with Dalmia's logistics team. Since the start of the assignment, both parties have thereby engaged in a number of discussions taking place at Dalmia's corporate office at Hansalaya Building, 12th Floor, 15 Barakhamba Road, New Delhi – 110001, by phone or with regional representatives at different company locations. As a result of these talks, Dalmia has already joined in as the shipper in both, the first and third Pilot Movement conducted within the scope of the current project.

Following the previous two generally successful upstream transports of bagged cement form Haldia, West Bengal to Bhagalpur, Bihar and Patna, Bihar respectively from Kolaghat, West Bengal to Bhagalpur, Bihar, Dalmia implied to become more interested in the conduct of a trial movement of bagged fly ash. Being a major input for the production of cement, fly ash has to be supplied to the cement manufacturing facilities. Reliable and on time delivery of all intermediate goods including fly ash is thereby of foremost importance in order to ensure an unimpeded production process of cement at the production sites.

In a phone conference on 16th April 2017, it was therefore suggested to conduct a downstream pilot transport of 300 metric tons of bagged fly ash on NW-1 from Kahalgaon, Bihar to Kolaghat, West Bengal. Following further negotiations on relevant operational and financial aspects and subsequent to the identification of an appropriate loading site at Kahalgaon by the Consultant's experts, a movement specific transport case was agreed upon with loading envisaged for 22nd May 2017. A corresponding transport option sheet was presented to IWAI on 19th May 2017 whereupon inland vessel M.V. Vivi Giri was formally requested by the authority.

3 Financial Aspects

After the clarification of all operational details and following a series of bilateral and internal negotiations, Dalmia, IWAI and the JV's Consultants agreed upon a movement plan specific transport case for the shipment of 300 metric tons of fly ash from Kahalgaon, Bihar to Kolaghat, West Bengal. A written confirmation including a request for the deployment of inland Vessel M.V. Vivi Giri was thereby released by IWAI on 21st May 2017.

As to the financial aspects of the pilot movement it was agreed upon a total freight charge of INR 135,000 for barge transport, corresponding to a freight rate of INR 450 per metric ton. As to the arrangement IWAI agreed to incur all costs for loading and unloading of the vessel, originally estimated at INR 120, respectively INR 175 per metric ton. In return and in addition to the above mentioned freight rate of INR 450, Dalmia accounts for all costs and organizational duties related to first and last mile transport of the shipment.

With regard to Dalmia's current road transports on the given O-D relation, an approximate freight rate of INR 1,120 per metric ton including pre- and onward carriage can be assumed as realistic. Although costs for pre- and onward transport must be added, it can thus be assumed that an operationally reliable IWT option at current rates offers the company an economically efficient and financially attractive alternative to land based transport modes. The following table shows the major cost items investigated during preparation of this Pilot Movement.

Table 1: Freight and Transport Charges

Position (Cost Item)	Charges (excl. Service Tax)
Loading of vessel at Kahalgaon, Bihar	INR 120 per ton
Vessel transport freight charges	INR 450 per ton
Unloading at Kolaghat, West Bengal	INR 175 per ton
Alternative truck rate	INR 1,120 per ton

Source: Consultants 2017

4 Operational Aspects

The fifth Pilot Movement covered the transport of 300 metric tons of fly ash from Kahalgaon, Bihar to Kolaghat, West Bengal. It therefore differs from the four previous trial movements in several regards: for one, it is the first downstream transport on Hooghly River conducted within the scope of the current project. Moreover it is the first movement of a commodity other than cement.

In order to safeguard a smooth and efficient operation as well as to mitigate delays, the execution of the movement was closely monitored by the Consultants' team of experts at all times. With a total length of 14 days from the beginning of loading operations at Kahalgaon, Bihar on 23rd May 2017 until finalization of unloading procedures at Kolaghat, West Bengal on 6th June 2017 the overall transport duration was well in the range of what was anticipated in advance. The following table presents a brief summary of information on the movement.

Table 2: Pilot Movement at a Glance

Route	Kolaghat – Bhagalpur
Shipper	DALMIA BAHART Cement Ltd.
Vessel Operator	IWAI
Vessel Name	M.V. Vivi Giri
Commodity	Fly ash (bagged)
Cargo quantity	300 metric tonnes
Distance on NW-1	710 km
Loading at Kahalgaon, Bihar	23|05|2017 – 25|05|2017
Date of Departure at Kahalgaon, Bihar	25|05|2017
Date of Arrival at Kolaghat, West Bengal	31|05|2017
Unloading at Kolaghat, West Bengal	03|06|2017 – 06|06|2017

Source: Consultants 2017

First mile transport was conducted by truck and was comparatively short as the origin of the cargo has been in the medium vicinity of the loading site, namely with Shiv Shakti Enterprises at Kahalgaon, Bihar. For last mile transport the fly ash had to be transported for approximately 70 km by road to the OCL India cement plant at Medinipur, West Bengal.

4.1 Loading Procedure

Originally scheduled for 22nd May 2017, loading operations started with a delay of one day on 23rd May 2017 and took until 25th May 2017. Loading took place at a location just outside the city of Kahalgaon, Bihar. The pre-identified site is thereby well accessible by public roads and trucks were able to bring the shipment of bagged fly ash within a distance of approximately 20 meters to the river shore from where it was manually loaded onto the M.V. Vivi Giri.

Berthing of the vessel at the loading site was comparatively unproblematic due to the low river current at Kahalgaon, Bihar. On the downside of loading operation it must be noted that one worker was injured during loading operation with no health insurance and no treatment facility provided either by labor contractor or barge operator. Moreover loading procedures were interrupted due to local people intervention and handling of the cargo was aggravated

due to old and damaged bags. Figure 1 below shows the loading site on the northern outskirts of Kahalgaon, Bihar.

Figure 1: Loading Location

Source: The Consultants 2017, based on Google Maps

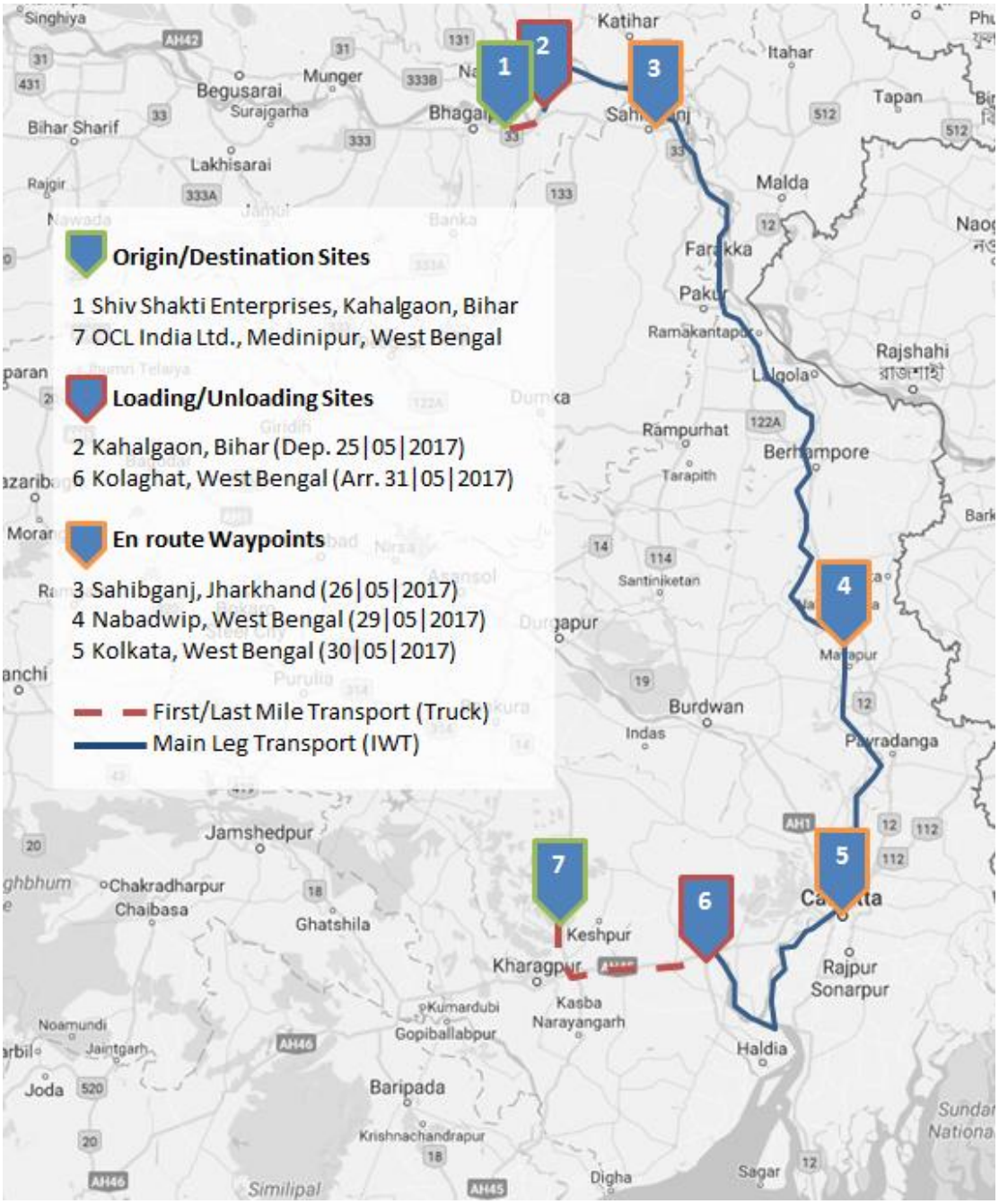
4.2 In-transit Procedure

Departure of the vessel at Kahalgaon, Bihar was on 25th May 2017. As the transport was going with the river current and with generally decent navigation conditions and a river draft of more than 1.7 metres en route, overall transit procedures on NW-1 were smooth and unproblematic. The total duration of the barge movement amounted to six days with arrival at Kolaghat, West Bengal on 31st June 2017. No en route groundings were experienced throughout the duration of the vessel's voyage on NW-1 and waiting time at Farakka lock was only one hour. Major waypoints passed en route were Sahibganj, Jharkhand on 26th May 2017, Nabadwip, West Bengal on 29th May 2017, and Kolkata, West Bengal on 30th May 2017. Figure 2 below shows a cartographical illustration of the main transport waypoints.

As to the rather few complications experienced during the course of this fifth Pilot Movement it can be noted that unavailability of night navigation due to unavailability suitable of navigational aid lights on various sections of NW-1 as well as a lack of en route bunkering facilities have caused some minor problems. As the transport included state border crossings, certain responsibilities fell under the competence of different regional authorities, thus complicating operational procedures. Moreover towards the end of the vessel transport a delay was caused due to low river draft on the Rupnarayan River near Kolaghat, West Bengal, resulting in a high tide dependency of vessel operation. This is in

addition to a general lack of both infrastructure and equipment available at both, the loading site at Kahalgaon, Bihar and the unloading site at Kolaghat, West Bengal (see also Section 4.3 on unloading procedure).

Figure 2: Movement Plan



Source: The Consultant 2017, based on Google Maps

4.3 Unloading Procedure

Following a comparatively smooth downstream transport on NW-1, the Pilot Movement experienced some late interruptions upon arrival at the unloading site at Kolaghat, West Bengal. The reasons for these delays in operational procedure were thereby manifold and related to both infrastructural shortcomings as well as other external influences. Figure 3 below shows the unloading location on Rupnarayan River at Kolaghat, West Bengal.

Figure 3: Unloading Location

Source: The Consultants 2017, based on Google Maps

Due to a lack of appropriate harbour infrastructure in the Kolaghat, West Bengal region, discharging of the Pilot Movement had to take place at a beach area with landside access for trucks. Within the scope of the current project, the site was already used as a loading location during the third Pilot Movement. Due to low river draft on Rupnarayan River at Kolaghat, West Bengal and corresponding tide dependent restrictions in waterside access to the unloading side, the transport vessel had to pause four kilometres downstream from its final destination and wait for high tide in order to get placed at the unloading site.

Figure 4: Unloading Operations

Source: The Consultants 2017

Further delays in discharging of the cargo were caused by high daytime temperatures as well as a dispute between workers and the contractor. Moreover a regional holiday in West Bengal caused an unavailability of labour, resulting in a further delay of unloading by one more day. However, the feasibility of night time unloading operation can be assessed positively.

5 Experiences and Findings

During conduct of fifth Pilot Movement several issues have been documented by the consulting team. These are mainly:

- Fly Ash was transported first time as a pilot movement trips along NW-1.
- A couple of bags were old and damaged. Barge operator was not responsible for damage of bags.
- Delayed in movement due to low river draft (depend upon tides) at Kolaghat.
- Loading was interrupted due to local people intervention.
- One labor was injured during loading operation.
- Vessel was berthed well due to low river current at Kahalgaon.
- Labor and truck operator was returned back for one day due to dispute between labor and contractor caused delay in unloading operation.
- There was a regional holiday in West Bengal which caused unavailability of labor and delay in unloading by another one more day.
- Night unloading operation has been conducted.
- Slow discharging operation due to less employed labor (14) and high temperatures in a day time.
- Lack of infrastructure and equipment.
- Lack of navigational aid lights.
- Invoices have to be raised by IWAI to Dalmia.
- No grounding of vessel during voyage duration
- Slow process due to involvement of IWAI regional office and their protocol.
- Only 1 hrs. waiting time at Farakka lock gate
- More than 1.7m river draft from Bhagalpur to Kolaghat.
- Lack Of bunkering Facility

6 Recommendations

In order to mitigate the negative impacts of specifically mentioned obstacles, circumstances and conditions the following measures are recommended:

- Provide sufficient and suitable navigation aid facilities
  - Target: Enable continuously travelling of barges day and night all along the NW-1.
- Identify locally available suitable work forces for loading and unloading operations
  - Suggestion: Implementation of local work force pools of approx. 25 workers each
- Inform local authorities about loading and unloading procedures to avoid interruption or disturbance by public.
  - Suggestion: Announce commencement of operations locally at least 3 days in advance
- Improve river banks and provide adequate loading infrastructure and equipment at the IWT loading sites at Kahalgaon, Bihar and Kolaghat, West Bengal
  - Suggestion: Implement river bank enforcements and provide flexible jetty infrastructure
- Improve river draft on Rupnarayan River at Kolaghat
  - Suggestion: Dredge Rupnarayan River at Kolaghat to allow unhindered vessel operations independent of tide conditions

7 Conclusion

Organizational and/or processual measures requesting low investment and could tap the potential to improve the competitiveness of IWT distinctly.

The issue „work force“ has to be developed as currently less availability and local (authority) interest had an negative impact on duration of conduct of this specific movement.

Construction of most flexible jetty infrastructure and/or river bank reinforcement will increase the utilization of IWT loading sites and reduce loading and unloading costs.

The involved shipper DALMIA has conducted its third Pilot Movement.

Shipper is still interested in conducting further transport of bagged cement and fly ash on several stretches of NW-1.

Publishing press releases supports the increase of awareness towards ITW distinctly.