



**Plan and Implementation Support for
Commercialization of NW-1**

Summary of 10th Pilot Movement

Kolkata to Mongla/Bd.

Interminable Commodity Management Pvt. Ltd.



04th April 2018

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1 Introduction

In India, the National Government intends to increase the use of inland waterway transport (IWT) and to exploit the potential benefits 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 the nation's inland waterways have undertaken major efforts to enhance the navigability on India's national inland waterways and boost freight movements by IWT.

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 as well as the presence of physical bottlenecks. Moreover, increasing pollution and fundamental environmental goals require a comprehensive and coordinated approach to an integrated national transportation policy. Recognizing the mode specific advantages and given the extensive network of rivers, canals and backwaters, the Indian Government therefore 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 IWT 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 sustainable development of freight movements on India's longest National Waterway.

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 engage into direct interaction with various relevant market stakeholders as well as the competent public authorities, 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 project's ongoing field work as well as the Consultant's profound knowledge of the Indian IWT market, this summary of the tenth 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 in bulk form from Kolkata, West Bengal respectively the loading location at GR Jetty to Mongla, Bangladesh and the efforts undertaken 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 requirements for commercially viable transports and their technical feasibility are discussed in Chapter 5. Chapter 6 gives recommendations on needs for action.

2 Preparation of Pilot Movement

During the ongoing market research conducted within the scope of the current project, the Consultants' local team of experts has early on been in regular contact with Interminable Commodity Management (India) Pvt. Ltd. Based in Kolkata, West Bengal, the company belongs to India's largest fly ash handling enterprises and is among the pioneers in encouraging utilization of fly ash, thus offering a solution to energy providers for the disposal of their solid waste.

On various occasions, Interminable Commodity Management (India) Pvt. Ltd. has expressed its interest to conduct trial transports of fly ash in bulk cargo form from West Bengal to different locations in Bangladesh. Following comprehensive discussions, a first pilot movement on the transport of 2,005 metric tons of fly ash between Kolkata, West Bengal and Narayanganj, Bangladesh was hence conducted in November and December, 2017.

Following this first transport and based on the experiences made and lessons learned, Interminable Commodity Management (India) Pvt. Ltd. agreed on a second pilot movement on the transport of 2,100 metric tons of fly ash on the approximately 311 kilometers long segment between Kolkata, West Bengal and Mongla, Bangladesh. Due to vessel availability and given the modifications made in advance of the first pilot movement, it has been decided to yet again involve MV Aaditya for this second trial run on the Indo-Bangladesh Protocol Route, a 2011 built ore carrying barge with a maximum capacity of 2,150 metric tons.

As a result of the continuous negotiations in between Interminable Commodity Management (India) Pvt. Ltd., the Consultants' team of local experts and Spring Professional Private Ltd. as the vessel operator, it was agreed upon a freight rate of USD 11.50 per metric ton for the barge transport of bulked fly ash, including costs for loading and unloading operations which were borne by the barge operator. Costs for first and last mile transport by road were however not part of the agreement and were paid for by the shipper.

3 Financial Aspects

Following the generally successful conduct of a first pilot movement of fly ash in bulk cargo form from Kolkata, West Bengal to Narayanganj, Bangladesh the shipper Interminable Commodity Management (India) Pvt. Ltd. expressed his interest in the conduct of a second pilot movement on the transport of fly ash from West Bengal to Mongla, Bangladesh. Under the consultancy of the Consultants' team of local experts, the fly ash trading enterprise and the barge operator Spring Professional Private Ltd. thus agreed upon the conduct of a second pilot movement of 2,100 metric tons of fly ash on NW-1 and the Indo-Bangladesh Protocol Route.

Both, the shipper and the barge operator thereby agreed upon a freight rate of USD 11.50 per ton (approximately INR 749) for barge transport of the shipment of fly ash, including all costs for loading and unloading at the waterways' entry and exit points at USD 1.40 per metric ton each. Based on the given transport volume of 2,100 tons of fly ash, IWT related transport costs thus amounted to a total of USD 24,150.00 (approximately INR 1,572,407) and were paid directly by Interminable Commodity Management (India) Pvt. Ltd. to Spring Professional Private Ltd.¹

Costs for first mile transport to the loading site at GR Jetty, West Bengal as well as for last mile transport from the unloading site at Mongla, Bangladesh to the transport's final destination were borne by Interminable Commodity Management (India) Pvt. Ltd. and not subject of the agreement on the pilot movement. Given the fact that shipper and the vessel operator managed to agree on a freight rate that did not require public gap funding, it can be assumed that a capable and reliable IWT operation constitutes both, a financially attractive transport and economically efficient alternative to current land based transport options.

Table 1 below shows the major cost items of the tenth pilot movement.

Table 1: Freight and Transport Charges

| Position (Cost Item) | Charges (excl. Service Tax) |
|---|--------------------------------|
| First mile transport to Kolkata GR Jetty, West Bengal | NA |
| Loading at Kolkata GR Jetty, West Bengal | Incl. in IWT freight charges |
| Vessel transport freight charges | USD 11.50 per ton |
| Discharging at Mongla, Bangladesh | Incl. in IWT freight charges |
| Last mile transport from Mongla, Bangladesh | NA |

Source: The Consultants 2018

¹ Based on the US Federal Reserve exchange rate of INR 65.1100 per 1 USD as of 30th March 2018.

4 Operational Aspects

The tenth pilot movement covered the transport of 2,100 metric tons of fly ash in bulk cargo form from Kolkata GR Jetty, West Bengal to Mongla, Bangladesh. It is the second pilot movement conducted within the scope of the current project that starts on NW-1 and continues on the Indo-Bangladesh Protocol Route cross-border to its final destination in neighboring Bangladesh. While the early pilot movements of this commodity featured the transport of bagged fly ash, the given transport is the second movement on the transport of fly ash in bulk cargo form.

The overall duration of the pilot movement including time for loading and unloading of cargo amounted to 21 days. Throughout the complete process of preparation and conduct and in order to detect potential hurdles and bottlenecks early on, the movement was thereby closely monitored by the Consultants' local team of experts at all times. Close monitoring allows to take countermeasures if necessary and to prevent, respectively to mitigate organizational or operational delays.

With regard to organizational delays, departure of the pilot movement from Kolkata GR Jetty, West Bengal was delayed due to non-availability of trucks for transporting the cargo to the loading site as well as a lack of labor force and industrial action at the GR Jetty terminal. Moreover, the public Holi holiday further prolonged loading operations of the tenth pilot movement. En route to Bangladesh, further delays were caused due to time consuming custom clearance procedures at Hemnagar, West Bengal and Khulna, Bangladesh as well as due to non-availability of navigation aids for night time operations.

Documentation included a cargo manifest that had been issued for the conduct of the pilot movement and that had been signed by the master as evidence for the cargo quantity on board.

Table 2 below presents a summary of information on the movement.

Table 2: Pilot Movement at a Glance

| Route | Kolkata GR Jetty – Mongla |
|------------------------------------|--|
| Shipper | Interminable Commodity Management Pvt. Ltd. |
| Vessel Operator | Spring Professional Private Ltd. |
| Vessel Name | MV Aaditya |
| Commodity | Fly Ash (in bulk cargo form) |
| Cargo Quantity | 2,100 metric tons |
| Distance on NW-1 (up to Namkhana) | 150 km (total distance incl. Protocol Route 311 km) |
| Loading at GR Jetty, West Bengal | 01 03 2018 – 12 03 2018 |
| Departure at GR Jetty, West Bengal | 12 03 2018 |
| Arrival at Mongla, Bangladesh | 18 03 2018 |
| Unloading at Mongla, Bangladesh | 19 03 2018 – 21 03 2018 |

Source: The Consultants 2018

4.1 Loading Procedure

Loading operations took place at GR Jetty on the southern outskirts of Kolkata, West Bengal. Loading of the bulk cargo fly ash started on 01st March 2018 and was finished by 12th March 2018. Loading operations involved the use of means of a compressed air tube system for loading the fly ash off the trucks and onto the inland vessel. As to the overall duration of charging operations, loading was severely delayed due to a shortage of trucks for first mile road transport over a total distance of approximately 16 kilometers (inter alia due to the national Holi holiday) as well as due to a shortage of workforce and industrial action.

Figure 1 below shows the site of the charging location at GR Jetty, West Bengal.

Figure 1: Loading Location



Source: The Consultants 2018, based on Google Earth

Figure 2 below provides illustrations of the charging of cargo at GR Jetty, West Bengal including the use of the compressed air tube system.

Figure 2: Loading operations



Source: The Consultants 2018

4.2 In-transit Procedure

Following the charging of 2,100 metric tons of bulk cargo fly ash at Kolkata GR Jetty, West Bengal, inland waterway vessel MV Aaditya departed on 12th March 2017 at 06:00 hours with a final draft of 3.3 meters. Tarpaulins were used to cover the hedges throughout the course of the movement in order to protect the cargo from moisture and other external influences and to prevent the fly ash from being blown away.

Due to generally good navigational conditions on NW-1's southern sector, the pilot movement was able to operate without significant restrictions on the first part of its routing. Having continued through the waters of the Sundarbans National Park and after having received custom Indian clearance at Hemnagar, West Bengal, the shipment crossed the Indo-Bangladesh border on 15th March 2018.

Following nighttime anchorages and Bangladesh custom procedures at Khulna, Bangladesh, the movement reached Mongla, Bangladesh in the late evening hours on 18th March 2018 at around 23:30 hours.

Figure 3 below provides a map of the IWT movement plan covered by this pilot movement.

Figure 3: Movement Plan



Source: The Consultants 2018, based on Google Maps

Throughout the vessel's journey, no en route groundings or other severe disturbances occurred. However, missing adequate night navigation facilities on the Protocol Route restricted operations of the pilot movement to daylight hours only. Moreover, some extra idle time occurred during customs procedures at Hemnagar, West Bengal and Khulna, Bangladesh.

Figure 4 below shows the tarpaulin structure mounted on-board the vessel MV Aaditya in order to protect the cargo from weather and other external influences.

Figure 4: Cargo Vessel MV Aaditya



Source: The Consultants 2018

4.3 Unloading Procedure

Discharging of the shipment of bulked fly ash took place at Mongla, Bangladesh. Unloading operations using a vacuum sucking device thereby started in the early morning hours of 19th March 2018 and lasted until 05:50 hours on 21st March 2018.

As during loading operations at Kolkata, West Bengal, discharging of the fly ash shipment at Mongla, Bangladesh was delayed due to a shortage of available trucks for last mile transport of the cargo over a distance of approximately 43 kilometers. Otherwise, no severe delays were encountered during the unloading operations and the use of a vacuum sucking device allowed for discharging operations without complicated modifications to the on-board mounted structure for the tarpaulins.²

Figure 5 below shows the unloading location of the tenth pilot movement at Mongla, Bangladesh.

Figure 5: Unloading Location



Source: The Consultants 2018, based on Google Earth

Figure 6 below provides illustrations of the unloading operations at Mongla, Bangladesh.

² During an earlier pilot transport of fly ash from Kolkata, West Bengal to Narayanganj, Bangladesh, the use of grab cranes for discharging of the cargo required a partly dismantling of the on-board mounted steel structure carrying the tarpaulins.

Figure 6: Unloading Operations



Source: The Consultants 2018

5 Experiences and Findings

During the tenth pilot movement several issues have been documented by the Consultants' team of experts. These include in particular:

- Second pilot movement involving the transport of fly ash in bulk cargo form, protected from moisture and other external weather conditions by an on-board mounted tarpaulin structure.
- Otherwise fast loading operation including the use of a compressed air tube system delayed by unavailability of trucks for first mile transport of fly ash to the barge's loading site as well as a lack of labor force.
- Issuance of necessary transport documentation, including cargo manifest signed by the master as evidence of cargo quantity carried on board.
- Smooth transport on NW-1's southern section downstream from Kolkata, West Bengal to Sagar Island, West Bengal.
- Continuation of barge transport on the Indo-Bangladesh Protocol Route with customs clearance formalities being performed at Hemnagar, West Bengal and Khulna, Bangladesh.
- Night time operations not always possible en route due to unavailability of adequate night navigation facilities, especially on the Indo-Bangladesh Protocol Route.
- No en route groundings due to sufficient available water depth at all stages throughout the course of the voyage.
- Unloading operation (also during night time hours) including the use of a vacuum sucking device allowed for a smooth discharging of cargo with the steel structure for wharves protection remaining largely in place.
- Discharging operation slightly delayed due to interim unavailability of truck capacity for last mile transport.
- Direct payment of vessel operator (Spring Professional Private Ltd.) by cargo owner (Interminable Commodity Management (India) Pvt. Ltd.), general overall economic viability for both parties results in no requirement for public gap funding.
- Costs for cargo handling during loading and unloading operations at USD 1.40 per metric ton each borne by the vessel operator and factored in freight rate.
- Commercial viability from the shipper's perspective however affected by operational delays resulting in a missed on-time delivery of the cargo.

6 Recommendations

Based on the findings of the tenth pilot movement of fly ash in bulk cargo form, the following actions are recommended:

- Ensure technical and operational feasibility of night time navigation on all sectors on NW-1 as well as on the Indo-Bangladesh Protocol Route.
 - Suggestion: Improve navigational aid infrastructure (inter alia navigation lights) on NW-1 and in the Sundarbans' waterways used by the Indo-Bangladesh Protocol Route, enter into consultations with relevant Bangladesh authorities to improve night time navigation facilities on their part of the international waterway route.
- Take measures to enhance operational efficiency and mitigate delays in ports as well as during first- and last-mile transportation.
 - Suggestion: Ensure the availability of sufficient port workforce and equipment for first- and last-mile transportation also during public holidays; invest in the availability and training of port workforce, launch public incentive scheme for investments in modes for first and last mile transport of cargo (if applicable).

7 Conclusion

Covering the transport of 2,100 metric tons of fly ash in bulk cargo form on NW-1's most southern stretch from Kolkata, West Bengal to Sagar Island, West Bengal and onward on the international Indo-Bangladesh Protocol Route to Mongla, Bangladesh, the tenth pilot movement conducted within the scope of the current project provides additional and new evidence on the potential benefits and capabilities of IWT for the transport of this bulk cargo commodity on NW-1 and cross border into neighboring Bangladesh.

The pilot movement demonstrated that given the availability of suitable vessel equipment and under adequate navigational conditions, transport by inland waterway barge offers a reliable as well economically efficient alternative for the transport of larger lots of cargo over greater distances and even across international borders. This confirms the findings made during an earlier trial transport on a shipment of the same commodity from the West Bengal area to Narayanganj in Bangladesh.

Moreover, the pilot movement again demonstrated the practical feasibility of the transport of fly ash in bulk cargo form. Compared to the earlier transport conducted within the scope of the seventh pilot movement, efficiency gains were thereby realized by using a vacuum sucking device instead of a grab crane during unloading operations. This allowed for fairly smooth unloading procedures and decreased required efforts for dismantling an on-board mounted steel structure.

As to the deficits encountered during this pilot movement it should be noted that night time operations of the pilot movement were not possible due to missing night navigation aid facilities, foremost on the Indo-Bangladesh Protocol Route section of the movement. Moreover, availability of trucks for first- and last-mile pre- and onward transport of the cargo constituted a major bottleneck in the end-to-end logistics chain and resulted in major operational delays of the movement that also affected the shipper's commercial viability.