USE OF WHATSAPP MOBILE APPLICATION IN PROJECT MANAGEMENT OF LARGE INFRASTRUCTURE PROJECT

– A CASE STUDY OF 1200 MW TEESTA-III HEP, SIKKIM

Abstract - The Case study brings out the use of IT application in Project Management of a 1200 MW Teesta III Hydroelectric Project in Sikkim which led to faster flow of information, transparency in information sharing and timely troubleshooting of the problems encountered during construction and commissioning stage leading to efficient engineering management of the project. The end results are - saving on project cost by eliminating time overruns and minimizing time required for troubleshooting.

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1200 MW Teesta-III HEP is a hydropower project located in North-Sikkim district of Sikkim state in India. It harnesses the hydropower potential of Teesta River in its upper reaches. The project construction commenced in 2008 under overall leadership of Teesta Urja Ltd., an SPV formed as a public private partnership project. The Teesta Urja Ltd is presently a Govt. of Sikkim company. The project is presently in the final stage of commissioning. The location of the project is shown in Fig-1 and project layout is shown in Fig 2.

Fig 1: Project Location: North Sikkim District, Dam site at Chungthang and Power House Site Near Mangan, the district headquarter
Fig 2: General Layout of 1200 MW Teesta-III HEP

The main features of the project are:

- 60 m high Concrete Faced Rockfill Dam (CFRD) with a Plastic Concrete Cut off Wall located 400 m downstream of the confluence of rivers Lachen Chu and Lachung Chu near village Chungthang
- Two number Tunnel Spillways (with one acting as a Diversion Tunnel also)
- A high level Surface Spillway with two bays on left bank
- One number Reservoir Flushing Tunnel on right bank, which also acts as an Auxiliary Spillway
- Two number Underground Desilting Chambers to remove silt particles of more than 0.2 mm size
- 13.86 Km long Head Race Tunnel of 7.5 m diameter (horse-shoe shape) with design discharge of 175 cumecs
- 150 m high Surge Shaft of 15 m diameter
- Two number 1127 m long Pressure Shafts of 4.0 m diameter each. Out of 1127 m length, 659 m length is Vertical and 468 m length is inclined.
- Underground Power House of 21.5 m x 48 m x 215.5 m housing 6 units of 200 MW each with vertical shaft Pelton turbines
- 1080 m long D-shaped Tail Race Tunnel of 8.0 m x 8.0 m size

The project is designed to generate 5214 million units of energy annually in 90% dependable year.

The project had to face slow-down from September, 2011 to October 2015 due to earthquake, financial constraints and ownership issues. These issues were resolved with active support of Govt. of India and project took off at full pace from November 2015 onwards. The balance works of the project involved large number of parallel and series activities involving civil, hydro-mechanical and electro-mechanical works for different project components viz, dam complex, desilting system, HRT, surge shaft, pressure shafts, underground power house and pothead yard works.

One of the remarkable aspect of project implementation from November 2015 onwards has been full integration of technical cooperation between owner team, owner engineer team, designers, civil, hydro-mechanical and electro-mechanical contractors and sub-contractors.

In this context, WhatsApp application was extensively used among project teams for flow of technical and managerial information resulting in efficient decision making process and speedy execution.

During the period from November 2015 till November 2016, there was large number of important activities to be attended. These can be listed as below:

a) Completion of balance works in right bank flushing tunnel (RBFT) including making the regulating gate operational and carrying out final cleanup of RBFT
b) Removal of coffer dam, construction of temporary dyke in front of diversion tunnel intake and diversion of river through right bank flushing tunnel
c) Plugging of diversion tunnel inlet structure on permanent basis
d) Completion of installation of various hydro-mechanical gates of spillways
e) Completion of balance works in underground desilting basin complex
f) Carrying out balance grouting and invert laying in parts of HRT and carrying out cleanup operation in 13 km long HRT
g) Installation of adit plugs and gates
h) Completion of installation of two number butterfly valves
i) Completion of grouting works in the surge shaft
j) Erection of steel liner in two no. vertical pressure shafts and carrying out backfill concrete
k) Carrying out dry commissioning activities in six number electro-mechanical power generating units
l) Final inspection of water conductor system
m) Filling of HRT and filling of pressure shaft
n) Filling of reservoir
o) Testing and commissioning of three no. generating unit in first phase

The schedule for completion of these balance works (first unit commissioning) was estimated as fourteen months till December 2016 and all the six units were to be commissioned by March 2017.

To achieve such a mammoth task, real time resolution of technical issues arising during execution was called for. In this respect, WhatsApp mobile application proved to be major communication tool which overcame communication barriers between teams and resulted in fast technical decision making.

Number of WhatsApp groups was created. These included:
- Pressure shafts Working group
- Dam Gates group
- Concreting works of Power House group
- Q C and Documentation group (quality issues of pressure shafts)
- Teesta 3 HEP group
- E and M group involving E and M contractor and their head office
- Commissioning team group
- T 3 and T 5 group for coordination with downstream projects especially during filling of water conductor system

Pressure shafts steel liner work in vertical portion was most critical during October/November 2015. The work required coordination between teams involving ferrule lowering and alignment and welding as well as backfill concreting of each ferrule in position using pumping technology.

The work also required the coordination between teams working at pressure shaft top and teams working at pressure shaft bottom which were separated by a road distance involving more than 3 hour road journey.

The work of Hydro-mechanical gates erection in the dam complex was to be executed at 6 to 7 locations. The gates erection work was critical from project commissioning point of view.
In the similar way, other works such as Electro-mechanical erection works and subsequent project commissioning work also required great amount of coordination for effective results.

The WhatsApp group members included the top technical management, project senior team members and working executives from the site. Since the project activities are spread over large geographical areas, the real time written communication among team members was only possible through WhatsApp.

Since, each member carried mobile handset with him all the time, the messaging in the group using WhatsApp was instant and everyone was equally informed all the times irrespective of the location. WhatsApp Mobile technology proved to be quite effective for group communication compared to email system or voice conversation. The biggest advantage was that continuous log of conversation including pictures, was available at all times with each member of the group for reference.

WhatsApp group system between teams overcame the barrier of communication, and engineering management of the project became efficient. It led to faster flow of information, transparency in information sharing and timely troubleshooting of the problems encountered during construction and commissioning stage.

Due to unique integration of contractor team, owner team and the designers, the timely decision making was ensured and the work was completed within time in spite of challenges of road communication, monsoon season and other site related problems. And thus, considerable time and cost overrun in the project completion has been avoided.

The wonderful experience of use of WhatsApp groups in project commissioning stage shall be utilized for efficient operation and maintenance of the project during O&M stage as well.

Such a novel use of technology may become more widespread in future projects implementation involving multiple teams.