ANALYSIS OF SHORT DELIVERY TIME SUBMARINE CABLE SYSTEMS

Mikinori Niino, (NEC Corporation), Yutaka Kiuchi, Masanori Takei, Naoki Maekawa (NEC Networks & System Integration Corporation)

Email: m-niino@cj.jp.nec.com

NEC Corporation, Meisei-Tamachi Building 4F, 29-23, Shiba 5-chome, Minato-Ku, Tokyo, 108-8420, Japan

Abstract: This paper analyzes the challenges of reducing the delivery time of submarine cable systems and discusses the related project management issues to be resolved. An evaluation of the key factors in reducing delivery times, such as logistics and resource management, permitting, environmental constraints and weather constraints is given. We describe how the effective recognition and resolution of such issues benefits the entire telecom value chain – from Purchasers, to suppliers, to subscribers.

1. ANALYSIS OF CURRENT TRENDS AND THEIR IMPORTANCE

It is important to complete and deliver a fully operational submarine communication system in the minimum time, which will maximize the effectiveness of cable infrastructure investments from the Purchaser's point of view. Improvements in the lead time for system delivery are welcome for suppliers, as these translate into improved customer satisfaction.

In order to achieve minimum delivery time, from a supplier's point of view, it is important to establish the overall implementation plan in the most careful manner based on the available resources, such as human power, manufacturing facility loads, vessels, testing teams, etc. One more key point is that the actual implementation follows this plan exactly, since any variation in the overall plan of work may necessitate changes to resource allocation, which is inefficient and potentially expensive.

Therefore, it is beneficial for both Purchaser(s) and supplier to discuss the project schedule, with the goal of aligning both parties' requirements. Fast delivery is one of the most common requirements in many cases.

This trend means that system delivery time is decreasing, such that a cable system previously delivered in 3 years may nowadays be delivered in less than 2 years. Many processes in the project implementation have been shortened because of enabling information technologies like cellular phones or the Internet allowing rapid information exchange. However, there are some processes such as cable manufacturing, vessel transit time, and cable lay and burial which constrain the system implementation schedule since their speeds are fixed and drastic improvement cannot be expected. In addition to this, various testing activities built into the project plan contribute a certain fixed duration to the project.

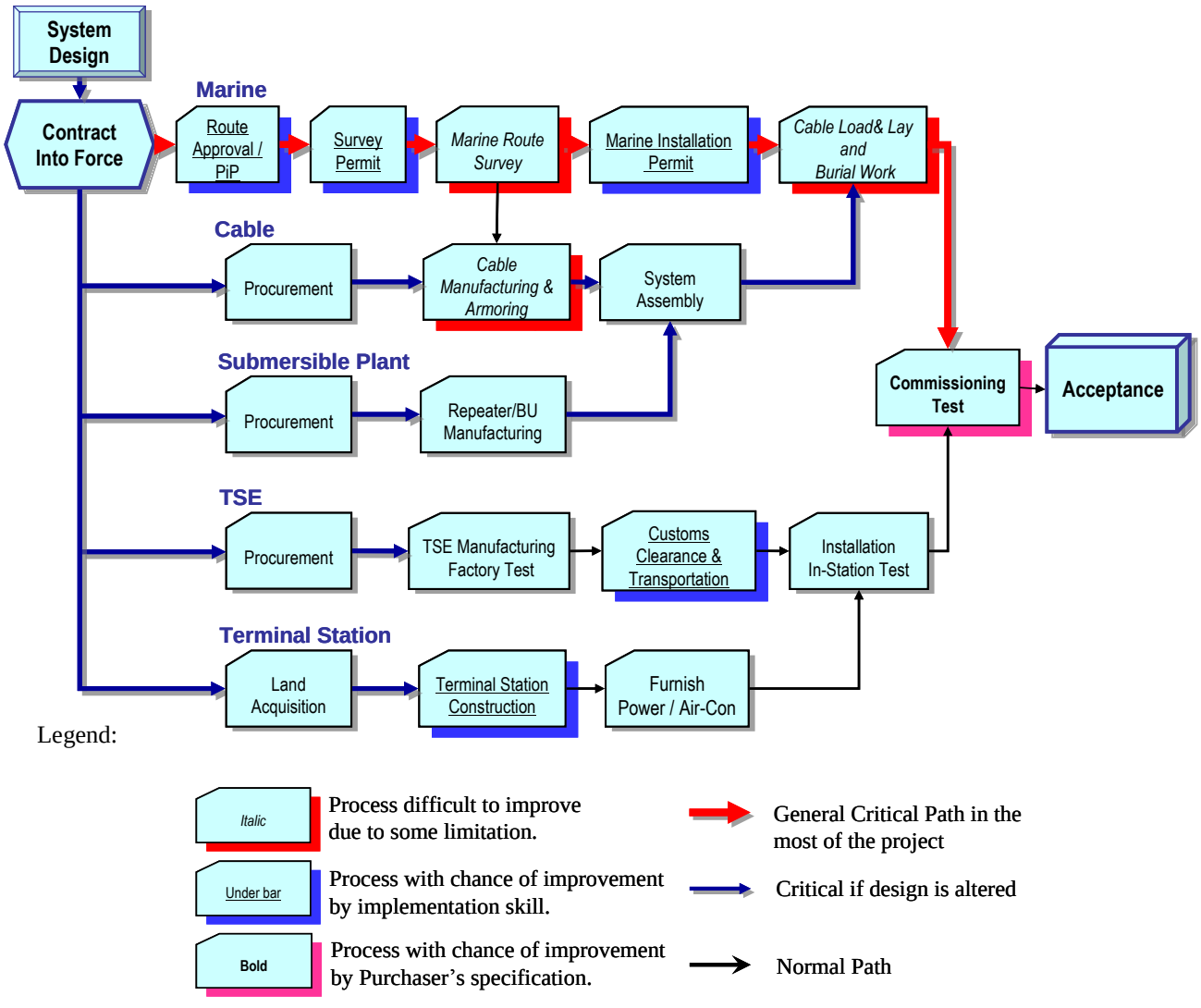
In such circumstances, we believe that it is a realistic solution to focus not only on reducing each individual process but also on synchronizing and harmonizing each process to reduce the total duration of

implementation. Such processes are mentioned in the next section.

The recent trend is to supply submarine systems on a turnkey basis including the system design, supply of equipment, marine route design and survey, cable laying and commissioning up to hand-over. Purchasers will choose the optimum supplier to deliver the system by evaluating each potential supplier's experience and ability to solve various issues during implementation.

2. MAJOR PROCESSES IN SUBMARINE SYSTEM IMPLEMENTATION

A submarine cable system is considered complete after passing multiple processes which take place sometimes in parallel and sometimes in sequence. In addition to the general sequence of events, each submarine cable project has its own unique criticality, which can be said to be characteristic of the project. For successful implementation, it is important to analyze such characteristics and reflect these into the plan. A typical critical path to project implementation is shown in a PERT chart, which indicates an example of the relationships between processes.



The PERT chart gives examples of the criticality of a project depending on its characteristics. If the project's critical path depends on cable manufacturing speed and/or cable lay/burial speed, radical improvement to the overall timeline cannot be expected. Typical examples can be found in projects in Asian waters, which contain much longer lengths of armored cable and burial compared with some other regions. Other criticalities typically occur in testing time. If there are many terminal stations, the number of DLSs (digital line sections) will be also be high, requiring appreciable time for testing.

There are some other key activities such as logistics, permitting, and CLS construction, which are also important to be synchronized with manufacturing and/or marine activities. Permitting, especially in complex territorial regions, is a key issue to implement the project on time.

3. RISK MANAGEMENT

Risk management is a core element in submarine cable system implementation. Submarine cable system implementation consists of a complex combination of processes. If any one of the processes stops, the influence to other processes sometimes can be very large and may significantly delay the entire project. Therefore acknowledging the entire process and assigning a contingency duration and/or contingency plan for each process is essential in project/risk management. The processes referred to in the previous PERT chart, especially those processes with red, pink or blue shadows, have a higher risk of delay in implementation. Therefore it is very important for both suppliers and Purchasers to manage these processes to deliver the system on time.

Turnkey supply is an effective implementation scheme since the supplier manages all the resources in the field. An example is the resource management and synchronization between the activities of cable route survey, cable manufacturing, repeater connection and load & lay. Note also that a turnkey contract is valuable in taking into account constraints of permitting difficulty and weather constraints during implementation. If the cable Purchaser selects separate suppliers on a process-by-process basis, the Purchaser must manage all activities with an appropriate time lag between them – to avoid the risks of insufficient feedback or very short notice to subsequent processes. For example, if insufficient marine survey data is fed back to the cable manufacturing process, there is a risk of delay – an obstacle to maximizing investment effectiveness.

Coming back to turnkey solutions, even if the supply contract were turn-key, it is impossible to implement the project only by the supplier. Information exchange in a timely manner between supplier and Purchaser is quite essential. In a typical case, Permit in Principle (PiP) acquisition is the Purchaser's scope of work, the status of which affects the total implementation process; therefore it is important to exchange information fully.

Another typical risk to the delivery date is a change in landing point. Since a landing point change broadly affects processes such as permitting (both permits in principle and operational permits), procurement, survey, manufacturing and installation.

4. THE ROLE OF PROJECT MANAGEMENT TEAM

From the above discussion, one very important thing is that both supplier and

Purchaser shall have a common understanding of the total project implementation process especially in terms of the critical path and the critical items that comprise it. The critical path is unique by project by project. A system with multiple landing countries may have a criticality in the form of applications for Permit in Principle (PiP) in each country. A system with long burial area has criticalities in the shape of manufacturing and cable burial. As previously stated, recognition of the division of project scope among supplier and Purchaser is equally important as well as timely exchange of critical information.

For the successful completion of the project, the supplier makes the overall plan of the project and arranges resources such as the survey vessel, factory line, engineers and cable ships. Obviously it is a hazard to the project if the project loses these resources. Therefore, all the parties involved to the project must adhere to the original plan in implementing the project with these resources.

5. CONCLUSION

As a conclusion, (a) turnkey supply of the system and (b) close co-operation between supplier and cable Purchaser will bring not only improvements in the lead time for system delivery – maximizing the effectiveness of cable infrastructure investment and customer satisfaction for the Purchaser – but are also welcome for suppliers to maximize the effective utilization of its resources.

Ultimately however, perhaps the most valuable qualities in a cable supply contract are the inter-personal relationships which allow supplier and Purchaser to trust and rely on each other to achieve a common goal.

6. PRACTICAL EXAMPLE

DDSCN, a domestic system connecting 8 islands in the Republic of Maldives (RFS: 2012) is a good example of realizing short time delivery.

Based on previous experience of implementing DSCN – which connects the Maldives with Sri Lanka (RFS: 2007) – DDSCN was brought to RFS just one year after CIF.

The key factor to achieve short delivery was to accurately assess in advance the essential characteristics of the project, incorporating the agreed Plan of Work, with the Purchaser. These characteristics were (a) logistics and (b) the distinctive Indian Ocean monsoon climate.

As air transportation is limited in this country, synchronized transportation by boat was scheduled and implemented for dry plant transportation and installation. In addition, marine route survey and main lay were conducted in March and November respectively to avoid the Indian Ocean monsoon. In spite of the fact that the main lay operation involved 12 instances of weather-sensitive cable landings, the weather stand-by of the main lay vessel was one day only. Thanks to each of the implementation teams' ability to stick to the project schedule, the project was ready for service without any delay.

Underlying this short delivery time, it was essential that there were frequent information exchanges between supplier and Purchaser based on a close working relationship, and that there was a great deal of local support by Purchaser during implementation.

