



ICPC Recommendation

Recommendation No. 10

The Minimum Requirements for Load and Lay Reporting and Charting

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Suggested Citation

International Cable Protection Committee. ICPC Recommendation #10, The Minimum Requirements for Load and Lay Reporting and Charting, Issue 3A, 1 June 2014.

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1. INTRODUCTION

The Load and Lay Report (LLR) contains essential information such as the position where the cable was installed on the seabed and data on burial and post-burial operations to protect it from known risks. The successful maintenance of a submarine cable system is dependent on the accuracy and completeness of information recorded in the LLR.

2. REPORT CONTENT

The content of the LLR should be agreed between the Purchasers and the Contractor at least two months before the commencement of installation activities.

The LLR should describe the entire cable installation i.e. Route Clearance, Pre-Lay Grapnel Run (PLGR), Shore End Load, Main Lay, Post-Lay Inspection and Burial (PLIB) and Post Installation Works.

The Contractor should provide a draft LLR to the Purchasers for their comments and approval as soon as possible. Each component of the LLR should be clearly identified, assigned an issue status (for document control purposes) and indexed in a contents list at the beginning of the LLR. Since several different contractors may be involved in the project, their respective contributions can be included as sub-reports provided that each one is separately referenced in the contents list.

PLIB operations will normally follow soon after main installation activities, therefore the Purchasers may require provisional data (e.g. as-laid Route Position List (RPL), Straight Line Diagram (SLD) and raw data from test results) to be made available within 24 hours of completion of the submersible plant installation. This information will enable the Purchasers and the Contractor to make the best possible decisions regarding PLIB operations.

The following are the main activities undertaken during a cable installation and the associated reporting and charting requirements:

2.1. Route Clearance/Pre-Lay Grapnel Run (PLGR)

In all areas where cable burial is required, the route should be cleared of all debris and Out Of Service (OOS) cables, so that subsequent cable installation and burial may be undertaken with minimal risk. The typical corridor for clearing obstructions is 500m on either side of the planned cable route.

The results of this operation should be reported in the LLR and include a description of all obstructions found together with their locations and (if relevant) the clump weights installed at the cut OOS cable ends (Ref: ICPC Recommendation No.1 Recovery of Out-of-Service Cables).

Operational data reporting recommendations for the PLGR will be similar to those applied during Route Clearance, and may also include textual and/or graphical reporting of tow tensions observed during operations.

This section of the LLR should typically include the following:

- Introduction (Project Overview).
- List of Equipment Used.
- Grapple Run Summary.
- Table of Cleared Cables (Clearance operations only).
- Diary of Events.
- Navigation Report.
- Daily Progress Reports (DPR).
- Incident Reports (as applicable).

2.2. Shore End, Load and Main Lay

This section of the LLR should detail the operations undertaken during cable loading and laying for both shore end and main lay installations (as applicable). As a minimum this should include the following information:

2.2.1. Text Report

- A detailed narrative installation report including all of the field data from which the installation charts are generated.
- A Diary of Events from mobilisation to demobilisation. This should include all significant field activities as well as a list of key personnel and their responsibilities, evaluation, equipment breakdown and repairs summary, etc. All text should be sub-divided into Load and Lay.
- Testing Officer's report, including all test data acquired from mobilisation to demobilisation.
- RPLs showing, as a minimum, the exact location of the submersible plant, the installed slack achieved between joint boxes and repeater housings, burial information, alter course positions and other events. Reference should also be made to ICPC Recommendation No 11 "Standardization of Electronic Formatting of Route Position Lists".
- If PLIB work is undertaken, there should only be one final RPL section in the LLR that includes information obtained by the PLIB operation.
- SLDs showing the final configuration of the submersible plant. Burial information and fibre type may also be included.
- Burial depth achieved along the route. Tow tensions should also be shown.
- Navigation report.
- DPRs, which should include details of observed environmental conditions, maritime traffic, offshore engineering activities and fishing activities together with associated radio messages.
- Incident Reports (as applicable).

2.2.2. Charts

- The position of the submersible plant as recorded during the installation should be shown on survey charts. The as laid route will be plotted on either an alignment chart or North Up chart (depending on what was specified in the route survey).
- If PLIB work is undertaken, there should only be one final set of charts in the LLR that includes position information obtained by the PLIB operation.
- The burial depth (inclusive of information obtained from PLIB) that is achieved at any point along the route should be shown on survey charts if alignment charts are specified. In cases where North Up survey charts were generated, a separate burial plot/chart should be included to show the achieved cable burial.
- Route clearance information, including details of obstructions found along the cable route and their current status (i.e. if they were removed or left in situ).
- An event log traceable to the RPLs on all charts.
- Any pertinent and important margin notes.

2.2.3. Video Records

Video recordings (e.g. from diver swim surveys) are normally produced when the shore-end of the cable is landed. This information provides a baseline record of the in-shore cable for later comparison with longer term observations of its condition. It also helps the Purchasers to decide if further protection of the cable is required.

2.3. Post-Lay Inspection and Burial (PLIB)

This section of the LLR will detail the applicable operations undertaken during the PLIB and should typically include the following:

- Introduction (Project Overview).
- List of Equipment Used.
- Dive Summaries (for all dives).
- Burial Summary Tables.
- Burial Graphs and Data.
- Diary of Events.
- Daily Progress Reports (DPR).
- Incident Reports (as applicable).

2.3.1. Text Report

A detailed narrative report should be provided together with the PLIB results to supplement and explain the data presented on the charts. This section should also include a comprehensive list of co-ordinates through which the PLIB was conducted together with detailed PLIB burial graphs produced from the navigation data in the

form of Kilometre Post (KP) versus Depth of Burial (DoB). The supporting navigation data must at a minimum include latitude, longitude, KP and DoB.

2.3.2. Charts

As indicated in Section 2.2.2, all acquired PLIB data (usually in the form of DoB profiles) should be shown on the as-laid charts (or burial plot/charts) so that a direct comparison with other information on the charts can be made.

2.3.3. Video Records

The PLIB video will help the Purchasers to evaluate the quality of cable protection achieved through the burial process. Areas where the cable is still at risk can be studied and decisions made on protecting any exposed cable using other methods.

PLIB operations often result in the production of many hours of video recordings, therefore all areas of particular interest should be supplied in an edited version for the convenience of the Purchasers.

2.4. Post Installation Works

This section of the LLR will detail all operations undertaken during the period between completion of the installation process and acceptance of the cable system by the Purchasers. The requirements for this section will usually be Purchaser specific, but are likely to include repair diagrams, jointing equipment used, jointing performance statistics, Section Sheet adjustments (detailing changes to the SLD) and fault analysis information.

3. REPORT FORMAT

Most Purchasers will require the LLR to be presented in a cost-effective softcopy format that is easy to distribute and some may also require at least one paper copy.

Depending on the size and complexity of the cable system and the softcopy format used it is not always possible to capture everything in an easily distributed form. The Purchasers and the Contractor should therefore agree the scope and format of information that is required in the softcopy of the LLR at least two months before start of installation activities.

The data obtained during the various marine installation operations and recorded within the LLR are based on the information gathered during the early survey and route planning phases. Therefore to ensure the most efficient use of Computer Aided Design (CAD) or Geographic Information System (GIS) software packages, the format of the final installation charts should ideally be consistent with the format used in these early phases of the project.

Where feasible, the as-laid charts should be updated in the event of a system repair. While such changes can usually only be made in the original format, updated data can be saved and presented in PDF format.

4. REFERENCES

Document Number	Title
ICPC Rec No.1	Recovery Of Out-Of-Service Cables

5. ABBREVIATIONS

The following abbreviations are referred to in this document.

Term	Definition
CAD	Computer Aided Design
DoB	Depth of Burial
DPR	Daily Progress Report
DVD	Digital Versatile Disc
GIS	Geographic Information System
KP	Kilometre Post
LLR	Load and Lay Report
OOS	Out Of Service cables
PDF	portable distribution format (associated with Adobe Acrobat)
PLGR	Pre-Lay Grapnel Run
PLIB	Post-Lay Inspection and Burial
RPL	Route Position List
SLD	Straight Line Diagram

6. ATTACHMENTS

Document Number	Title
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7. ACKNOWLEDGEMENTS

The ICPC is grateful to Mr. Fanie Pretorius of Telkom S.A. Ltd for originally identifying the need for this Recommendation and providing the first draft.