



ICPC Recommendation

Recommendation No. 10

The Minimum Requirements for Load and Lay Reporting and Charting

Note: Issue status suffix 'A' relates to minor format changes, not content.

Contact for Enquiries and Proposed Changes

If you have any questions regarding this document or suggestions for improving it, please contact:

International Cable Protection Committee Ltd
PO Box 150
Lymington
SO41 6WA
United Kingdom

Secretary:

Tel:

Fax:

E-mail:

ICPC Web-site:

Mr. Graham Marle

+ 44 1590 681 673

+44 870 432 7761

secretary@iscpc.org

www.iscpc.org

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1. INTRODUCTION

The Load and Lay Report is a reflection of a submarine cable's installation and contains valuable information such as the projected or actual 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 submarine cable and submerged plant is a function of how accurately and effectively this marine installation data is presented within the Load and Lay Report.

The data obtained during the various marine installation operations and contained within the Load and Lay Report are also based on the information gathered during the early survey and route planning phases. The format of final installation charts should ideally be consistent with the format used in these earlier project phases, so as to ensure the most efficient use of Computer Aided Design (CAD) software packages, and therefore ensure the usefulness and consistency of the Load and Lay Report to the Purchasers.

2. CONTENT OF A LOAD AND LAY REPORT

The Load and Lay Report should form the definitive document describing the entire cable installation i.e. Route Clearance, Pre-Lay Grapnel Run (PLGR), Main & Shore End Load and Lay, Post-Lay Inspection and Burial (PLIB) and Post Installation Works.

Usually within 1 month of the completion of the submersible plant installation, the Contractor should provide a preliminary Load and Lay Report to the Purchasers for their comments and approval. However, the Purchasers may require provisional data (i.e. 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. PLIB operations will normally follow soon after main installation activities and so having the aforementioned information ready in the shortest possible time will allow the Purchasers, and the Contractor, to make the best possible decisions regarding PLIB operations, thereby saving time and money.

It is recommended that the content of the Load and Lay Report be discussed and agreed between the Purchasers and the Contractor at least 2 months prior to the commencement of the installation activities. This will ensure that agreeing to this preliminary version is only a formality, possibly with only minor changes to get to the final version.

The following paragraphs describe the activities undertaken in the course of a cable installation and the associated reporting and charting recommendations associated with each of those operations.

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

In all areas where cable burial is required, the route must be cleared of all debris and Out Of Service (OOS) cables prior to installation operations, so that cable burial may be carried with minimal hindrance and therefore operational risk. The typical corridor for clearing obstructions is 500m on either side of the engineered route.

It is recommended that the results of this operation are depicted in the Load and Lay Report, to include a description and location of obstructions and, where 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 Pre-Lay Grapnel Run (PLGR) will be similar to that obtained during Route Clearance, and may also include text or graphical reporting of tow tensions observed during operations.

A typical format for this Section of the Load and Lay Report should include the following:

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

2.2. Main & Shore End Load and Lay

This Section of the Load and Lay Report will detail the operations undertaken during cable loading and laying for both shore end and main lay installations (as applicable). It is recommended that as a minimum this Section should include:

A. Text

- A detailed narrative installation report including all field data, from which the installation charts are generated.
- A Diary of Events from mobilisation to demobilisation. This shall include all significant field activities as well as a list of key personnel and their responsibilities, evaluation, equipment break down/repairs summary, etc. Text should be sub-divided into Load and Lay.
- Testing Officer's report including all test data acquired from mobilisation to demobilisation.
- Route Position Lists (RPLs) showing, as a minimum, the exact location of the submersible plant, installed slack achieved between joint boxes and repeater housings, burial information, alter course positions and other events. (Comment: if PLIB work is undertaken, then there should only be one final RPL section in the Load and Lay Report that includes information obtained by the PLIB operation)
- Straight Line Diagrams (SLDs) showing the final configuration of the submersible plant. Burial information may also be included on the SLD.
- Burial depth achieved along the route. Tow tension should also be depicted.

- Navigation report.
- Daily Progress Reports (DPR), to include environmental conditions, shipping traffic, offshore engineering activities and fishing activities observed together with any exchange of radio messages regarding these.
- Incident Reports (as applicable).

B. Charts

- The position of the submersible plant as recorded during the installation depicted 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. (Comment: if PLIB work is undertaken, then there should only be one final set of Charts in the SLLR that includes position information obtained by the PLIB operation)
- The burial depth, inclusive of PLIB, achieved at any point along the route depicted on survey charts if alignment charts are specified. In cases where North Up survey charts were generated, a separate burial plot/chart shall depict the cable burial.
- Any Route Clearance information or obstructions found and removed or not removed from the cable route.
- An event log traceable to the Route Position List (RPLs) on all charts.
- Any pertinent and important margin notes.

C. Video Material

Video data (i.e. from diver swim surveys) are another important piece of in-shore installation information, produced when the cable is landed at its respective landing points.

This information is important as it provides a record of the baseline record for the in-shore cable against longer term observations of its installation condition. It also provides the Purchasers the opportunity to decide whether to further protect the in-shore section of the cable when in-shore (diver) burial is not possible.

It is recommended that the Purchasers obtain this information from the Contractor in Video CD (VCD) or Digital Versatile Disc (DVD) format, in addition to normal videotape format.

2.3. Post-Lay Inspection and Burial (PLIB)

This Section of the Load and Lay Report will detail the operations undertaken during Post-Lay Inspection and Burial (PLIB) (as applicable). A typical format for this Section of the Load and Lay Report should 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).

A. Text

A detailed narrative report should be provided 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. It should also contain detailed PLIB burial graphs (Kilometre Post (KP) versus Depth of Burial (DoB)), produced from the navigation data. The supporting navigation data must at a minimum include latitude, longitude, KP and DoB.

B. Charts

As indicated in Section 2.2b, all acquired PLIB data, usually in the form of DoB profiles, should be depicted on the as-laid charts (or burial plot/charts) so that a direct comparison with other information already on the charts can be made.

C. Video Material

The PLIB video is an important piece of information available to the Purchasers to evaluate cable protection through the re-burial process. Areas where the cable is still at risk, where even re-burial failed, can be studied and decisions made to adequately protect the cable using other available methods.

It is recommended that video material accumulated by the vessel performing the PLIB operations is made available in a format that is easily viewable by the Purchasers. It is recommended that the Purchasers obtain this information from the Contractor in Video CD (VCD) or Digital Versatile Disc (DVD) format, in addition to normal videotape format.

It is also recommended that the areas where re-burial failed, or where the cable is at risk of being damaged, are identified and extracted from existing video footage onto separate storage media, as the PLIB operations consist of many hours of video, much of which is not of interest for re-evaluation purposes.

2.4. Post Installation Works

This Section of the Load and Lay Report will detail the operations undertaken during Post Installation Works (as applicable) (i.e. those works necessary prior to system handover and acceptance, such as pre-service repairs). The requirements for this Section will usually be Purchaser specific, but in addition to any items discussed above, are likely to include Repair Diagram, Jointing Performance Statistics and Jointing Equipment Used, Section Sheet Adjustment (to detail changes to SLD) and Fault Analysis Sheet.

3. PRESENTATION OF A LOAD AND LAY REPORT

The choice of format the data is presented in is very important as the most cost effective presentation method is always preferable e.g. where software is readily available through daily use or can be freely downloaded from the internet etc.

At a high level, the complete report can be presented in a set of CD-ROMs, and at least one paper copy of the complete report is also likely to be a requirement.

Due to the fact that the Load and Lay Report will consist of a great deal of information (depending on the size and complexity of the system) it is not always possible to have one physical CD-ROM or document that captures the whole Load and Lay Report.

It is therefore recommended that the Purchasers and the Contractor decide what physical documentation the Load and Lay Report will comprise. This should also be agreed 2 months prior to the commencement of installation activities.

Hard Copies

It is recommended that, because of all the documentation, each piece of documentation is clearly numbered/marked (and includes an overall contents list) so that it can easily be identified within the whole that makes up the Load and Lay Report.

Furthermore it is recommended that all documentation be clearly marked with an issue number, since changes might take place in the preliminary review stages.

Soft Copies (CD-ROMs)

With the large number of available software presentation packages and techniques in the marketplace it has become more important to decide which software to use for the presentation of the Load and Lay Report on CD-ROM media.

It is recommended that the Purchasers evaluate the software available to them at no additional cost and request the Contractor to present the material in these formats. Such software might include Microsoft Office for text and spreadsheet type data and CAD packages with free viewers for chart data. Another option is to also put all the data (even charts) into PDF (Portable Document Format), which is widely used today around the world to distribute documentation. The advantage of this format is that the files generated are relatively small in size and can easily be shared via the Web or e-mail if need be. Furthermore a free reader for *.pdf files can then be downloaded from the Internet from Adobe Acrobat. Where feasible, the as-laid charts should be updated in the event of a system repair during its operational life. While such changes can usually only be made in the original data format (CAD packages, such as Autocad or Microstation, or a Geographical Information System (GIS), such as Intergraph GeoMedia or ESRI ArcInfo/View) 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. DEFINITIONS

The following words, acronyms and abbreviations are referred to in this document.

Term	Definition
CAD	Computer Aided Design
CD-ROM	Compact Disc-Read Only Memory
DoB	Depth of Burial
DPR	Daily Progress Report
DVD	Digital Versatile Disc
GIS	Geographical Information System
KP	Kilometre Post
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
VCD	Video Compact Disc

6. ATTACHMENTS

Document Number	Title
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7. ACKNOWLEDGEMENTS

The Executive Committee wish to place on record their appreciation of Mr. Fanie Pretorius of Telkom S.A. Ltd for originally identifying the need for this Recommendation and providing the first draft.