

Chapter 2

Planning and Preparation for Installation

Considerable planning and preparation will be necessary before the equipment is transported to the site for installation. Information must be gathered and the equipment needed at the site identified. This is unlikely to be the first visit of the installers to the site. At least one or more of the team members should already have travelled to the site and the main village where the team has to stay and have established contacts with the local lead persons. Therefore, travelling to the site should not pose a problem. However, the route for transporting the equipment may be somewhat different than that used for people; some equipment may have to be airlifted and then manually transported, for example. The best time for travel, transportation, and installation of equipment should also be considered. The rainy season, harvest time, festival time, or very cold or hot seasons will not be suitable for working at the site. It can take between two weeks and six months to complete the installation, depending upon the size of the plant, the remoteness of the site, and whether it is an easy or difficult scheme.

Briefly, the installation process will include the following.

- Packing and transporting equipment and materials to the site and storing them there
- Finalisation of the sites for the weir, intake, power canal and its sub-components (desilting basins, spillways, crossings), forebay, penstock and powerhouse (These will have been demarcated during the surveys.)
- Measurement and minor adjustment of locations of some components such as the base of the turbine, the forebay, and the intake mouth
- Construction of all civil structures — including foundations for the turbine, generator, and agro-processing equipment — and construction of support piers, anchor blocks, and such like
- Installation of the penstock pipe and accessories
- Installation of the turbine, generator, agro-processing units (if provided), and coupling/drive systems
- Installation of the transmission and distribution wires
- Testing and commissioning (starting, testing, measuring output, resolving defects)
- Training the managers and operators
- Handing over the plant and certification

Sometimes, most of the civil construction work will have been completed before equipment arrives at the site. In other cases, however, it may be convenient to complete the civil work and the installation of the electro-mechanical equipment and transmission system at the same time in a prescribed sequence.

If for some reason the installation work has to be discontinued, adequate planning will be necessary to prevent damage to the components already installed or constructed and to the remaining equipment and materials; and this includes the cement, which can easily be spoiled as a result of exposure to rainwater or humidity. Similarly, newly constructed civil works, such as earthen canals, may have to be protected from damage during the monsoon rains or from other occurrences.

Usually, two or three persons; who together have the necessary expertise, will travel to the site. But they may not all stay all the time. The main expertise needed is in the fields of:

- site assessment and survey (to assess geophysical features and changes since the last survey and make some measurements of distances);
- civil construction;
- installation of electro-mechanical equipment, including the penstock;
- laying transmission lines; and
- commissioning and testing.

4

Information should also be collected and verified regarding availability and cost of skilled and unskilled labour and construction materials. In addition, the location of the nearest adequate workshop (with, for example, welding facilities or other tools), health care centre, and communication facility should also be identified in advance, if possible.

2.1 Tools and Other Materials for the Site

A comprehensive list must be prepared of tools and instruments to be carried to the site that may be needed during the installation. The list should also include materials to be transported. It is best to prepare a proper checklist (see Annex I for an example).

Furthermore, all the drawings of the parts and components with the installation instructions must also be carried to the site. These include the weir, intake, canal, forebay, penstock route, powerhouse, the mechanical components (such as trash racks and expansion joints), and the specifications and construction details for the various foundations. The decisions regarding construction materials, that is what needs to be carried and what can be acquired at the site, should also be made in advance (these include such things as doors and windows, corrugated iron sheets, wooden beams, and steel bars). Some of this material can be provided or acquired by the communities involved. In fact, completion of most of the civil work can and should be the responsibility of the beneficiary communities or the entrepreneur.

It is usual that some land and length measurements have to be carried out again. It may be necessary to measure the length of the penstock more accurately. Or the penstock length may need to be adjusted by a few centimetres, necessitating measurement of the length, and possibly raising or lowering of the base of the turbine or forebay. Similarly, a few surveying tools, for example, an Abney or Dumpy level, will be needed to mark out the construction of the power canal, intake, and weir.