IRP for Malawi

Transmission Planning – On-the-Job Training

Tentative Programme, Lilongwe, 7 – 18 November 2016

Norconsult

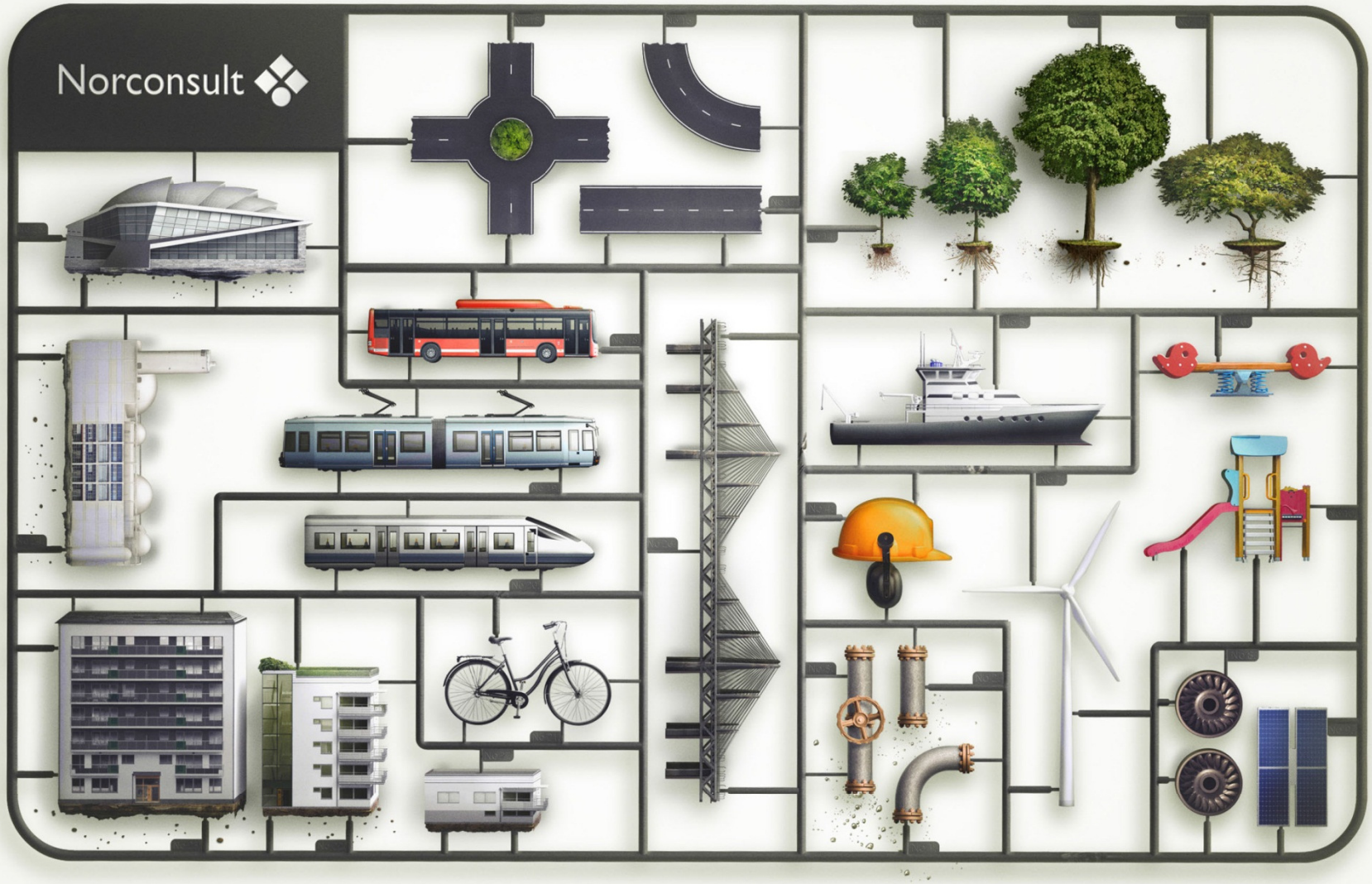
IRP for Malawi – Transmission Planning
On-the-Job Training
Tentative Programme – Week 1

- **7 November 2016: Welcome and Introduction**
  - Arrival & Registration
  - Introductions with brief mapping of background, knowledge and expertise of transmission planning
  - Objective and methodology for transmission planning
- **8 November 2016: Power System Analysis - Steady State Modelling of Components**
  - Basic theory on power system components and modelling for steady state analysis
  - Exercises: Adding power system component data. Review of the Malawian grid model with focus on correct modelling of components.
- **9 November 2016: Power System Analysis - The Malawian Power System**
  - Modelling existing system (review and update of simulation models)
  - Constructing cases based on system descriptions and demand-supply solution sets
  - Exercises: Building one or more future cases for power system analysis
- **10 November 2016: Power System Analysis – Load Flow**
  - Power flow analysis with contingency analysis
  - Voltage control and reactive power
  - Exercises: Finding limitations in the Malawian power system
- **11 November 2016: Power System Analysis – Transient and Dynamic Behaviour**
  - Introduction to dynamic power system analysis
  - Transient stability – inertia and generator impedances
  - Dynamic stability – damping of power oscillations
  - Specific problems that may arise when interconnecting Malawi with other SAPP and EAPP utilities

Norconsult

IRP for Malawi – Transmission Planning
On-the-Job Training
Tentative Programme – Week 2

- **14 November 2016: Least-Cost Transmission Planning**
  - Introduction to economic planning principles
  - Cost elements for optimisation purposes
  - Optimising methodology for new transmission lines
  - Exercise: Optimising the voltage level and cross section for a planned transmission line
- **15 November 2016: Least-Cost Transmission Planning**
  - Introduction to investment analysis for transmission planning
  - Investment costs for high-level planning purposes
  - Other cost elements to consider
  - Lifetime for equipment
  - Timing of sub-projects
  - Determining the optimum investment alternative
- **16 November 2016: Least-Cost Transmission Plan – Study cases for Malawi**
  - Starting to construct a least-cost transmission plan for Malawi
- **17 November 2016: Least-Cost Transmission Plan – Study cases for Malawi**
  - Continued work on the least-cost transmission plan for Malawi
- **18 November 2016: Presentation and Wrap-Up**
  - Wrap-up and presentation of status of the work



Thank you