Use Case 4: Extension Implementation

Summary:

A project, once approved by the management from a budgetary point of view, enters into a detailed design phase before the construction work, the commissioning of the system and finally its hand-over to the operations department.

Actor(s):

Name	Role description
Network Extension Planning	• Prepares the five-year plan, including renewal and voltage conversion plans. • Designs all extensions and optimises the supply system. • Performs “What-if” analysis and defines the protection concept.
Construction department	• Performs all transformation and extension work in the stations and on the network. • Is responsible for possible external sub-contracting (e.g. civil work)
Network Operator	• Performs supervisory control (through SCADA-NMS) • Carries out the operation plans • Ensures the safety of the public and field crews • Guides the field crew where to locate equipment • Manages field resources • Carries out activities on the network through agents
Network Model Maintainer	• Creates and maintains graphic displays, connectivity model, facilities records, maps • Creates and maintain routing sheets that optimise travelling distances for troublemen • Distributes the updated documents to the various departments • Gets authorised approval for important documents
Operational Planner	• Receives switching or work request from construction crews, maintenance crews, field crews, contractors • Receives action requests from customer account management • Receives incident reports from Network Operator • Constructs plans to deal with work requests from construction or to respond to an emergency • Prepares switching sheets • Co-ordinates with field crews and neighbouring organisation for planned outages and works • Ensures controlled, predictable and safe operating • Analyses incident • Defines tentative schedules and priorities
Field crews (Operatives)	• Perform planned switching • Accept work permits • Indicate readiness for switching

	• Perform planned works • Report incidents and other abnormalities in the network

Participating Systems:

System	Services or information provided
Geographic Information System (GIS)	• manages the records • provides knowledge of where the equipment is and possibly what it is
Facility Management System, or Asset register	• manages the assets • provides knowledge of what the equipment is (if not done by the GIS)
SCADA-NMS	• manages real-time process information and control; • provides historical data about outages, operation, supply quality and system loading; • services: Power Application Software for network simulation and contingency analysis
Trouble Call Management System	• manages customer calls • provides records about customers' trouble calls
Utility Accounting and Administration System	• work and material purchasing, delivery and settlement management • project planning and HR management • project controlling and re-costing
Work Management System	• Allocation of work, staff and initiation of updating the Asset Register

Pre-conditions:

A construction/extension project is approved by the management from a budgetary point of view

Normal Sequence:

No.	Use Case Step	Description
1.	Setting Up the Final Project	Choose the alternative upon technical-financial criteria, assign work orders, inform the related services (public phone, water, gas, the state, etc.)
2.	Getting the Internal Authorisations	Get the OK from the operation and accounting departments
3.	Plan the Implementation	Estimate the construction time for the station(s), MV/LV cables and lines Negotiate work beginning delays Delivery of the civil work (CW) and electrical material
4.	Prepare the Implementation	Organise line displacement and temporary cables Establish the supply interruption plan Request access permission Notify municipalities and population for possible disturbances

5.	Implement the Project	Construct the lines Install the cables Built the station(s) Connect the circuits/devices
6.	Documentation	Update the schemas, base maps, facility data base, etc.
7.	Commissioning	Check circuits versus schema's, earth impedance Carry out Pressure Test Check protection co-ordination Check phasing Load the circuits
8.	Setting the System's extension into Operation	Configure the system for normal supply Remove the temporary circuits
9.	System Hand-over	Transfer the responsibility to the operation (and to the customer if it is a customer transformer station)

Alternate Sequence:

None

Post-conditions:

System's extension operates normally.

References:

Use Case – UC13 Extension Planning

Use Case – UC11 Operational Planning.