MOBILIS SITE LIFE CYCLE WHITE PAPER.DOC

Consistel Marketing

General Document

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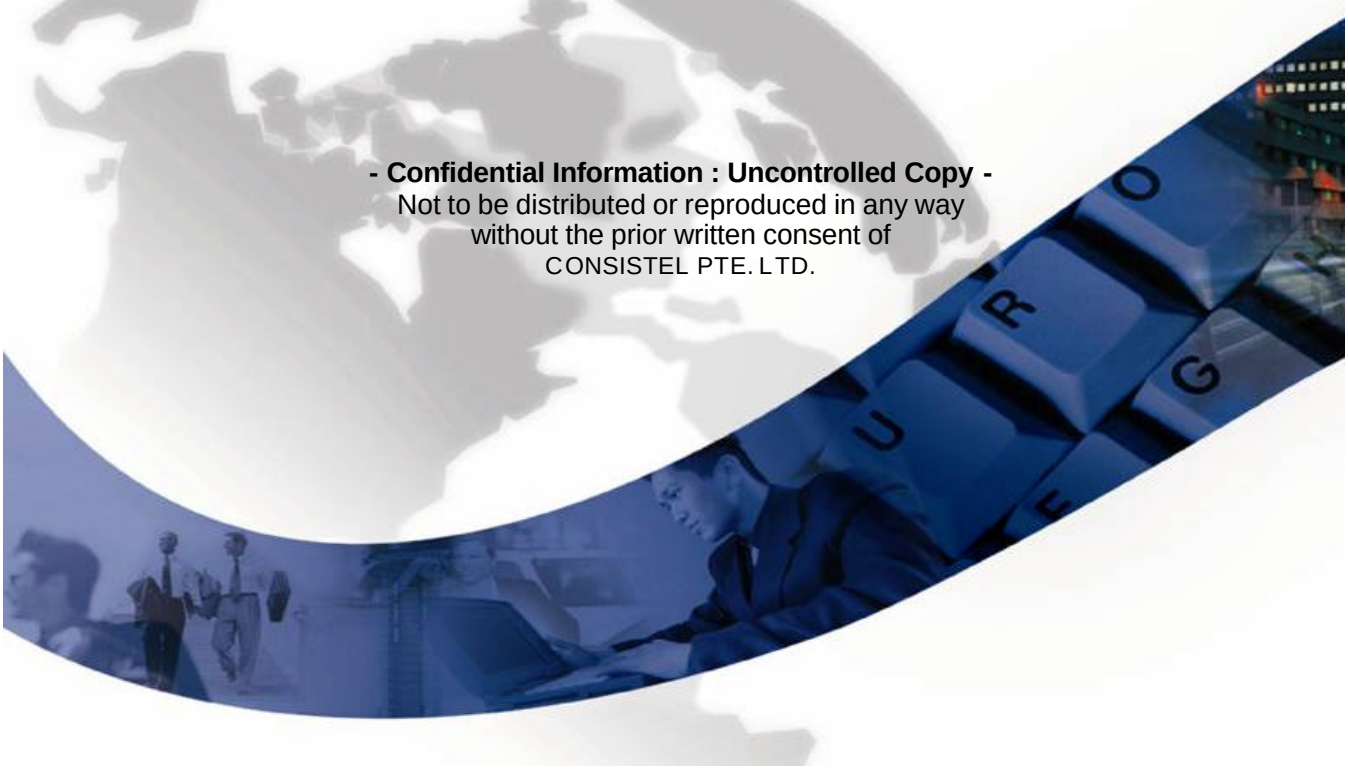

1. DOCUMENT CONTROL

1.1. Change History

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1			
2			
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Network Infrastructure Management System

A practical illustration of a typical Site lifecycle

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2. GLOSSARY

The following terms appear within this document:

Term	Description
LAN	Local Area Network
API LOS	Application Programmer Interface Line of Sight
SLA	Service Level Agreement
Works Order	Site Search Order
Snag List	Punch List
DDF	Digital Distribution Frame

3. INTRODUCTION

Telecommunications Service Providers have, in the migration from fixed line to mobile services, moved from centrally located to geographically dispersed infrastructures with thousands of cell sites. This evolution has, almost globally, now matured from the heady days of aggressive, start-up, expansion associated with the development of mobile networks, where acquiring customers was the primary concern of networks above and beyond cost control.

Mobile Service Providers are, with the onset of the telecommunication industry recession, pressed to deliver returns through consolidation of customer bases and optimising operational efficiencies often epitomised by investment in OSS/BSS systems:

- Financial – including the well accepted SAP
- ERP for Enterprise
- CRM for customer Relations Management
- Document Management
- NIMS – Network Infrastructure Management Systems

Probably the major cost of Mobile Service Providers is that of owning, operating, managing and enhancing the physical network; incorporating new technology and enabling new services including the adoption of GPRS, EDGE and 3G means management visibility is critical for controlling costs.

Network rollout, maintenance and upgrading now poses significant challenges to Mobile Service Providers seeking affordable network infrastructure. Along with the physical infrastructure many more obligations need to be considered, each having recognisable cost implications:

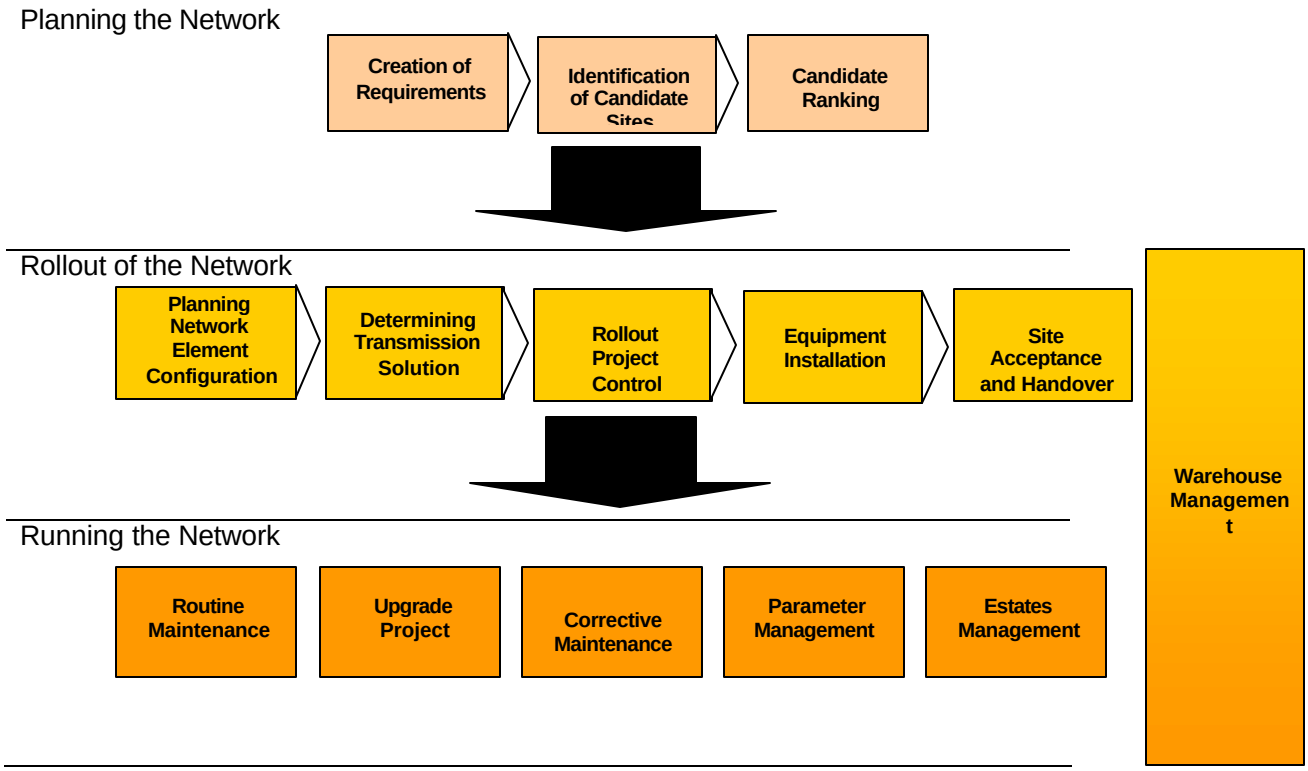
- Estates - site leases
- Health-and-safety
- Network parameters
- Equipment warranty information
- Local government regulations

This document provides an overview of the issues facing Mobile Service Providers and the comprehensive and cohesive software solutions offered by CONSISTEL.

4. PLANNING THE NETWORK

The CONSISTEL software products used in this chapter are:

- CONSTRUCTO
- SPECTO
- MEDIUS



4.1. Creation of Coverage Requirements

4.1.1. Coverage Requirements start with Radio Planning

The first stage in the network implementation lifecycle is the creation of coverage requirements within the Radio Planning tool. CONSTRUCTO allows the effective management of the rollout process from this starting point right through to the site acceptance and handover stage. The network coverage requirements are represented within CONSTRUCTO by the creation of Works Orders. In order to ease double entry of data, it is possible to create the Works Orders automatically via an interface with the Radio Planning tool, although the records can also be created manually using the Works Order module within CONSTRUCTO. The Works Order defines the coverage requirement details via the GIS position and search radius, and using this information it is possible to see the Works Orders displayed via the SPECTO map functionality.

4.1.2. Definition of the Site Build Project

It is also important to specify what exactly is being searched for, so in addition to the GIS information, CONSTRUCTO allows the definition of the project within the Works Order. Depending on what kind of project is specified determines the correct project plan template that will have to be executed in order to implement the site build. Factors such as network element type and the region in which the Works Order is located identify the precise project plan that will be associated with a particular site rollout.

4.1.3. Identification of Candidate Sites

Following the creation of a Works Order it is necessary to record the possible candidate site locations that could satisfy the coverage requirement. Depending on the business there are a number of ways that CONSTRUCTO will allow the creation of these records within the database.

4.1.4. Importing Candidate Site Details

Commonly the site search process is outsourced to external acquisition companies, and CONSTRUCTO offers two solutions for the capture of the candidate sites data in these circumstances. The first option for entering the site details uses the MEDIUS API module (functionality that allows the mapping of data for simplified import and export from the system). This scenario offers the ability for the contractor to email a completed and predefined spreadsheet of identified sites, which can then be easily loaded into CONSTRUCTO. The advantage of this approach is that the external contractors require no access to the CONSTRUCTO database, and the spreadsheets can be populated remotely from the system, even while present during the site survey.

4.1.5. Utilising Web Access for External Contractors

The second option utilises the web based deployment option available with CONSTRUCTO. Using the security facilities within the application, the external contractor user accounts can be safely configured to only have access to the Sites Management records they are creating. The contractors can then log into the CONSTRUCTO application via the World Wide Web and create the Sites records without being able to access other company confidential areas in the system. This benefits the operator by directly receiving the results of the site searches they have paid for, while eliminating the need to record this information themselves.

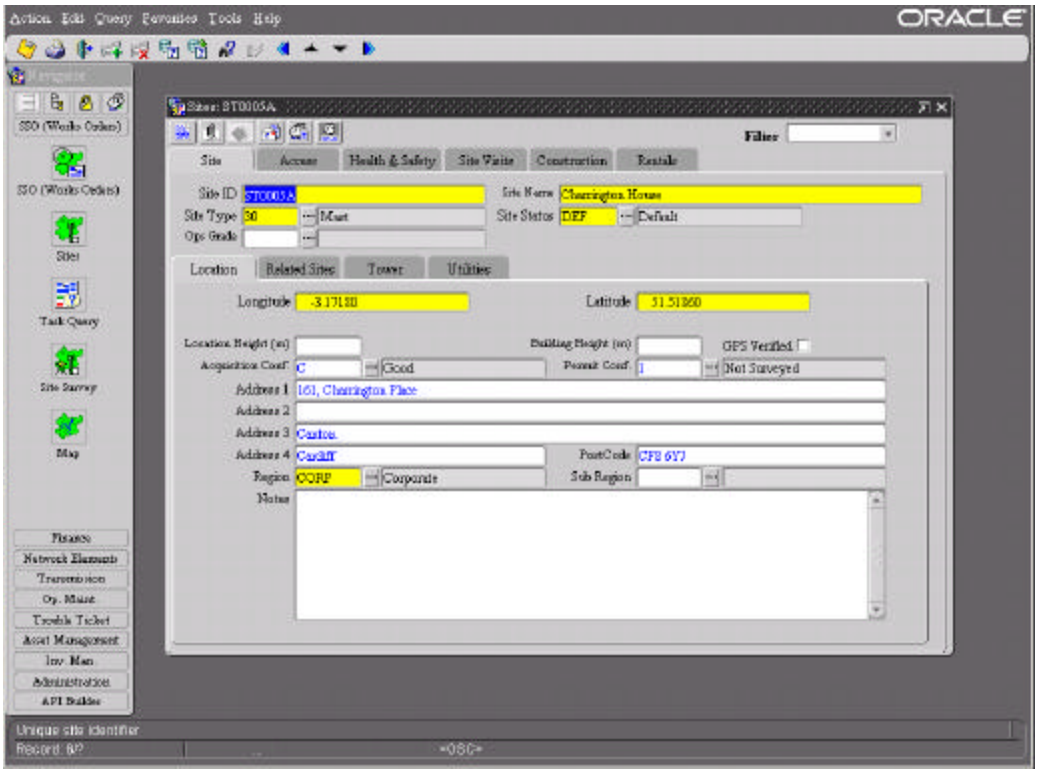


Figure: Sites Management form accessed via Web deployment

Thirdly, candidate sites can be created directly into the Sites Management form. This is typical if the site acquisition department works internally to the operator and has full access to the organisations' LAN. The Sites Management form allows the recording of the necessary site and location details, including access times, survey information, and rental and landlord details.

4.1.6. Visibility of Sites in GIS

Of course, there will be many candidate sites in the database. The results from other nearby Works Orders will be visible, and potentially utility company sites that are preloaded into the application and governed by a Master legal agreement, so that these candidate options exist prior to creation of the Works Order itself. The seamless integration of the Sites and Works Orders within SPECTO makes the identification of geographically suitable sites highly visible and straightforward to use.

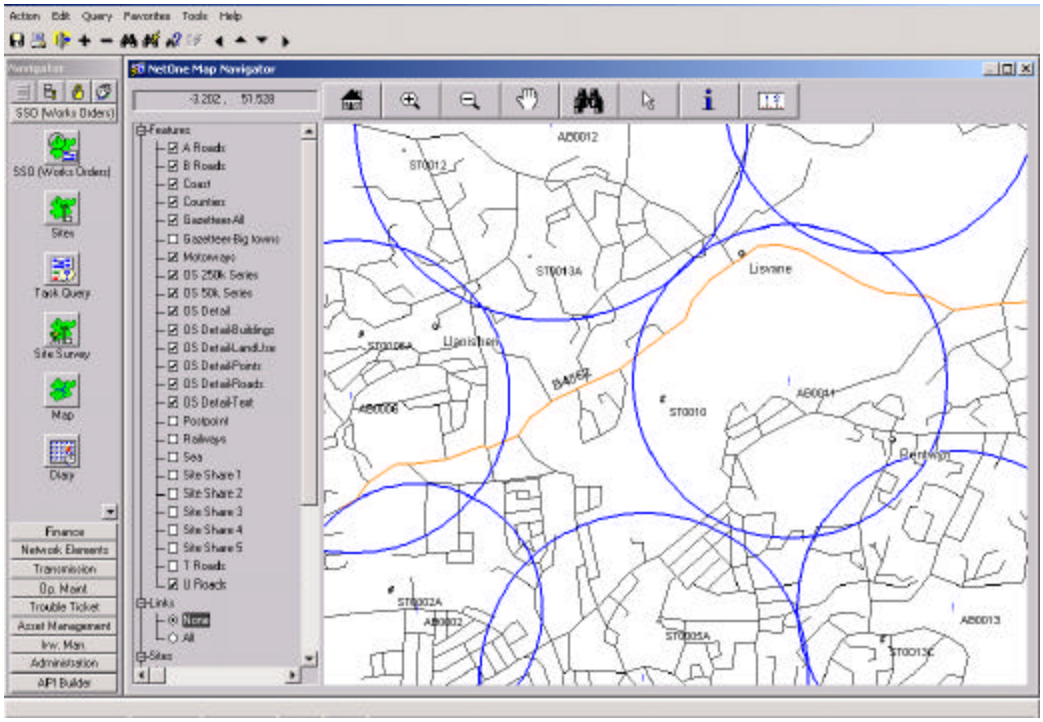


Figure: SPECTO GIS Map – displaying Works Orders and Candidate Sites

The Candidate Sites that are chosen can be assigned to the Works Orders so they are related within the system, and this information is then available to return to the Radio Planning tool via the interface.

4.2. Candidate Ranking

Before any site build or detailed design can be undertaken, a decision has to be reached regarding which of the potential candidate sites will be selected as the most suitable. CONSTRUCTO has a number of features that can be used to control this decision and record the outcome of the ranking process.

4.3. Control of Tasks

The Works Orders module provides project control via the activity list – a representation of all the tasks required to complete the site build from a predefined template project plan associated with the Works Order. One of the features of the activity list important to the candidate ranking process is the possibility to identify tasks that are to happen for each of the multiple candidate sites. For example, an indication that the landlord has been contacted and is willing to cooperate may be required before the candidate site can be chosen as suitable; this milestone can be represented as a task that has to be completed, for each separate candidate, before the ranking meeting can be held.

4.4. Feasibility relating to the cost of Transmission

An important factor in determining the most suitable candidate is cost, and one of the key determinants of this is the capability of the site to host a microwave transmission link. The Line of Sight (LOS) survey module provides a tool for the management and scheduling of this task. If the LOS survey cannot be completed on a specified date because of poor visibility, then the module automatically increments the priority of the work, and requests that the survey is rescheduled for a later date. The tasks that form the LOS survey are also filtered to the Works Order activity list, so there is visibility of the progress of this work for other departments, and dependent tasks (such as the Candidate Ranking milestone) will not commence until their completion.

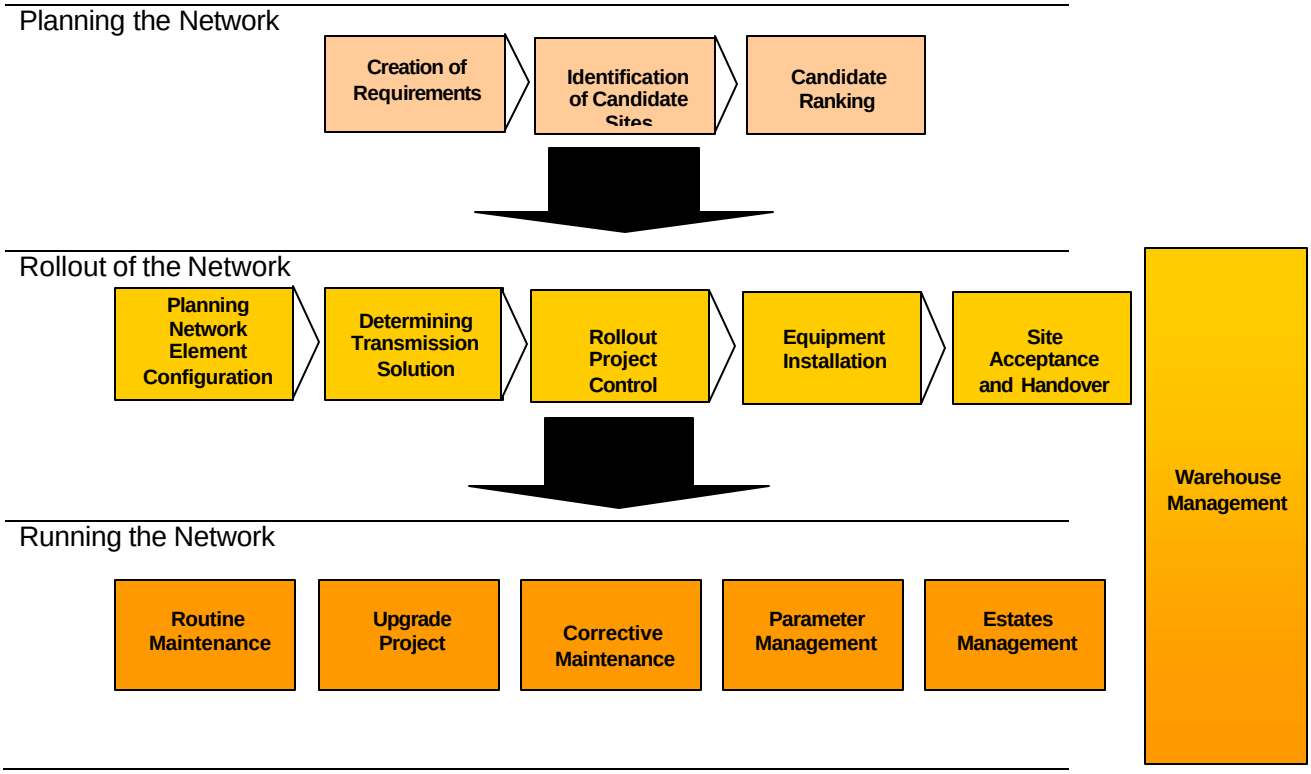
4.5. Recording the Ranking Outcome

The outcome of the ranking meeting is recorded within the Works Order module alongside the display for the assigned candidates. Because the ideal site is not always available, and because occasionally sites are rejected later in the rollout process, both the technical ranking for suitability and the progress status are recorded. The technical ranking of the candidate defines the sites suitability, regardless of the decisions made. The progress status records the actual outcome of the ranking meeting, normally with one site chosen as the "Best Candidate", and a number of other candidates either on standby or rejected. The statuses of the candidates are also clearly visible and available for filtering against using SPECTO's functionality.

5. ROLLOUT OF THE NETWORK

The CONSISTEL software products used in this chapter are:

- OPERIS
- CONSTRUCTO
- EFFECTO
- MOTIO
- SPECTO



5.1. Planning Network Element Configuration

5.1.1. Flexibility for multiple kinds of network element

After the identification of the candidate site, the network element going to be constructed first needs to be designed. The Network Element module contained within OPERIS allows the definition of the element type and controls its status. Because there are so many kinds of network element possible, and each has different information storage attributes, the module is capable of designing different screens depending on the kind of Network Element created. These dynamic fields allow the application to support any number of different types of network element and support variations in equipment from different vendors.

5.1.2. What equipment comprises the network element?

After the configuration and main attributes of the network element are recorded, it is necessary to go into further detail and record a complete list of all the equipment necessary for the build. OPERIS provides a planned parts screen that can be called directly from the Network Elements module. After recording the equipment quantities required for the network element, the screen additionally allows the mapping of Part Ports to DDF positions. This detailed design information can be used as the framework for the installation of the equipment, and can also be later used as one of the 'building blocks' for designing the transmission circuits.

5.1.3. Where can equipment be installed?

The planned parts list has the capability to enter information about the size and coordinates of the cabinets and equipment being installed at a site. SPECTO contains a Schematics module that can graphically display this floor plan information, which aids in the identification and planning of equipment installation.

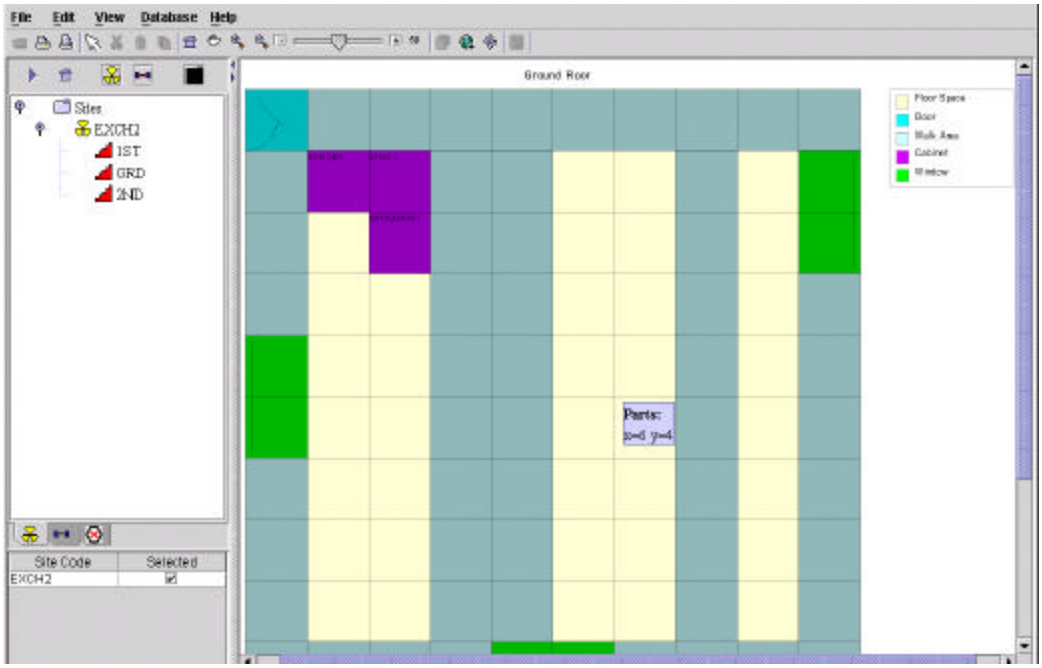


Figure: Floor plan screen from Schematics module

5.2. Determining Transmission Solution

5.2.1. Creating Links between Sites

The LOS survey carried out as part of the initial site survey process indicates if a site is capable of linking to the Network via microwave transmission. Following on from this survey, the Link Provisioning module, which forms part of OPERIS, allows the complete design of the transmission links. The links are created recording the "A end" and "B end" sites, and the capacity and type of transmission link. Dynamic fields are also available in the Link Provisioning module, so that different screen and different fields are available depending on what capacity and link type is selected. For example, Leased Line and Microwave links require very different information recorded about them, apart from recording the two sites that they connect.

5.2.2. How are the Links connected?

The Links screen allows the definition of the equipment that comprises the transmission link. Using the Planned Parts screen both the "A end" and "B end" sites have an equipment list related to them. This equipment can then be mapped to the available DDF positions within the site, and so completely recording every aspect of the physical connectivity. Importantly here, because CONSISTEL software products can be seamlessly integrated forming a cross-departmental single database, it is immediately clear which DDF positions are available on the site. Because the DDF is shared equipment across the site, any positions occupied by different transmission links and network elements are clearly highlighted within the Planned Parts form. This means that engineers from every department are provided with the same view of spare capacity at a site.

5.2.3. Connecting the equipment via circuits

In order to completely define the transmission topology the next step will be to plan the circuits across the links. OPERIS provides the capability to record circuits down to a detailed port mapping level, and will document the progress of the circuit between each different link and site from commencement to completion. Although this information is complicated, the entry into OPERIS is simplified because the building blocks for these circuits and the possible routes are defaulted from the information that has already been entered earlier in the process. The mapping information for both network element equipment and every transmission link is offered step by step in the "Auto-Route" function, so that defining complex circuits becomes an exercise in selecting from Lists of Values.

Depending on the transmission solutions implemented across the network, the Circuits module can be further defined to support SDH, grooming of circuits across links, onward routing and timeslot mapping.

5.2.4. Understanding the equipment configuration

Having populated detailed circuits and complete port mapping information into OPERIS, it is also important that the information can be viewed in a clear fashion. A high capacity site with numerous transmission links can support a large number of circuits, and this information in table format can be very complicated to digest. The Schematics module in SPECTO displays full circuit information in a graphical format, and it is possible to zoom in and out to different levels of complexity. This supplies an easier format in which the user can view the transmission and connectivity information.

Figure: Schematics Module from SPECTO

5.3. Rollout Project Control

The site build rollout process contains numerous milestones that require management to ensure they are completed at the correct times. Some of these milestones relate to other activities that can be carried out within CONSTRUCTO, such as the design tasks above, and some milestones are concerned with external activities like approval points, contractor management, and progress control.

5.3.1. Defining the rollout process

CONSTRUCTO allows the complete rollout process to be captured within a project plan template, so that all the inter-dependencies between tasks are clearly defined, and each of the durations and responsibilities of the tasks are recorded. The dependencies between the tasks provide two functions for the user. Firstly, the calculation of forecast planned dates based on the duration of the tasks. Every time a planned date is manually adjusted, or a new completion date is entered, the dependent tasks within the plan are reforecast to take account of the changes. Secondly, the dependencies allow the execution of the tasks at the correct point of time, and various notification methods are available to inform the assigned engineer that the particular job requires commencement.

5.3.2. Assigning tasks to individual users

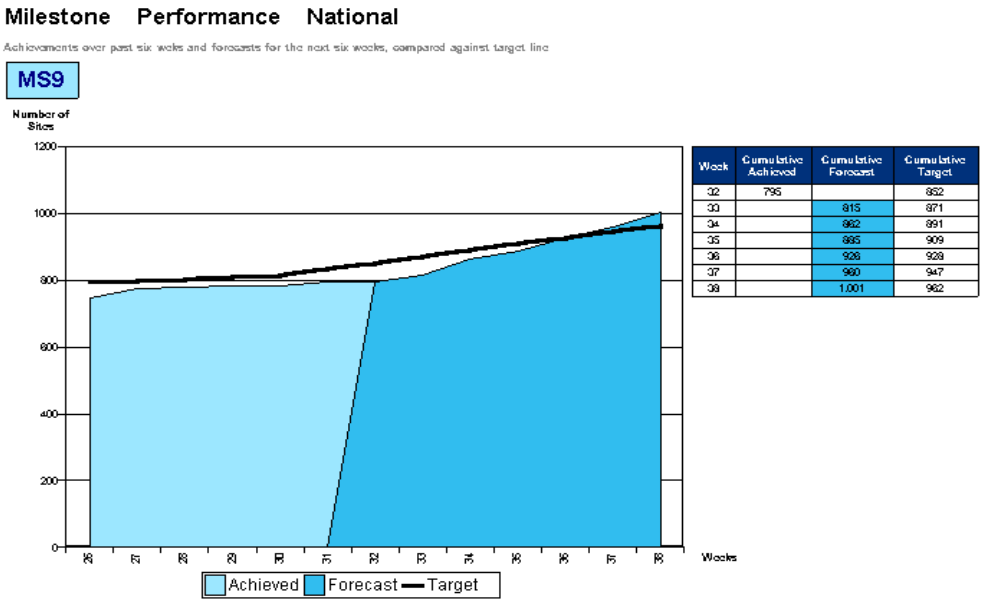
The assignment of tasks to individual users is important to provide visibility of workload to the engineers and their managers. CONSTRUCTO modules like the Engineer Diary and the Queues screen, both indicate upcoming and current tasks using different views of the information. However, the task assignments also provide important contact information for other users from different departments. If there is any query about the progress of the rollout of the site, users can quickly identify the person responsible for the task and contact them directly.

5.3.3. Enforcing the correct business processes

Obviously, any system is only as effective as the manner in which it is used. One of the main benefits of the CONSTRUCTO database is the cross-departmental visibility of information and management of projects. To further enforce the use of correct business processes the application also offers the capability to link data entry with the completion of milestones. If required, a milestone will present a screen to the user when the completion date is entered, and this screen can enforce the completion of certain mandatory values. For example, the site access details can be enforced to be entered after the site survey stage, to ensure that prior to making the site operational the access information is available to maintenance engineers. This close affiliation between data and process is key in ensuring that effective practices are adopted across the business.

5.3.4. What is progress of the network rollout?

The most effective tool for management is the availability of accurate information. The project control functionality within the Works Orders module is closely integrated with EFFECTO. This reporting module offers the design and running of powerful reports on the progress of milestones. Ad-hoc reports can be easily created to quickly supply desired information, and published standard corporate reports can be scheduled and automatically distributed by the tool. Using EFFECTO makes the appearance of bottlenecks, trends in performance, and regional diversities simple to identify and therefore correct.



Week	Cumulative Achieved	Cumulative Forecast	Cumulative Target
32	795		852
33		815	871
34		862	891
35		885	909
36		928	928
37		960	947
38		1,001	962

Figure: Example graphical report produced from EFFECTO

5.4. Equipment Installation

One of the final phases in the site build is the installation of the equipment at site, although reference to equipment should be considered throughout the site build. In order to report accurately on the valuation of the network, and to interface with asset registration systems for the calculation of depreciation, it is vital to understand exactly where each equipment part is located.

5.4.1. Providing early forecasting of equipment requirements

The planned parts documented against the network element provide the earliest information to the Logistics manager of the equipment that will be required for each site build. Using the status transition functionality used throughout CONSISTEL software products the logistics manager can approve the equipment

list and therefore denote that this equipment has been reviewed and ordered. This security control means that the system enforces that the equipment list is not changed later without first informing the logistics manager.

5.4.2. Easing data entry with Barcode Scanning

At the time of equipment installation it is critical that the information is recorded accurately if the asset system is to be effective. If the information is available, MOTIO can be utilised to show exactly what equipment is at each location, even to the detail of showing the equipment that is stored on board a maintenance vehicle. In order to promote the accuracy of the information MOTIO provides an interface capability for barcode scanning hardware. The use of scanning minimises mistakes and also vastly increases the speed at which equipment transactions can be recorded.

5.4.3. Applying common sense to the movement of equipment

The application also controls which equipment movements are valid to carry out within the network, and so enforces the company's business rules. For example, it can be set that equipment cannot be moved directly from an area maintenance office to a site, and instead must be first moved to a vehicle. For auditing purposes, because the transaction includes two steps, the full history is available including delivery times and the vehicle used; this could be vital in the case of identifying what equipment was in a vehicle prior to a theft for insurance purposes. It is also possible to apply similar rules to the equipment status, so the example could be further expanded to state the equipment can only be moved to a site if its status was being set to "Operational".

5.5. Site Acceptance and Handover

5.5.1. Who has the authority to promote network elements?

The final stages of the rollout process relate to site acceptance and handover. Only users that have been assigned the correct privileges can make status changes in CONSISTEL software products. This feature can be used for the handover and acceptance stage as different departments will be allowed to set different statuses against the network elements. The status path could follow "Operational", "Accepted", "In Service", and "Commissioned" with each status change corresponding to a different department and relating to a different point in the acceptance route.

5.5.2. Managing snag lists

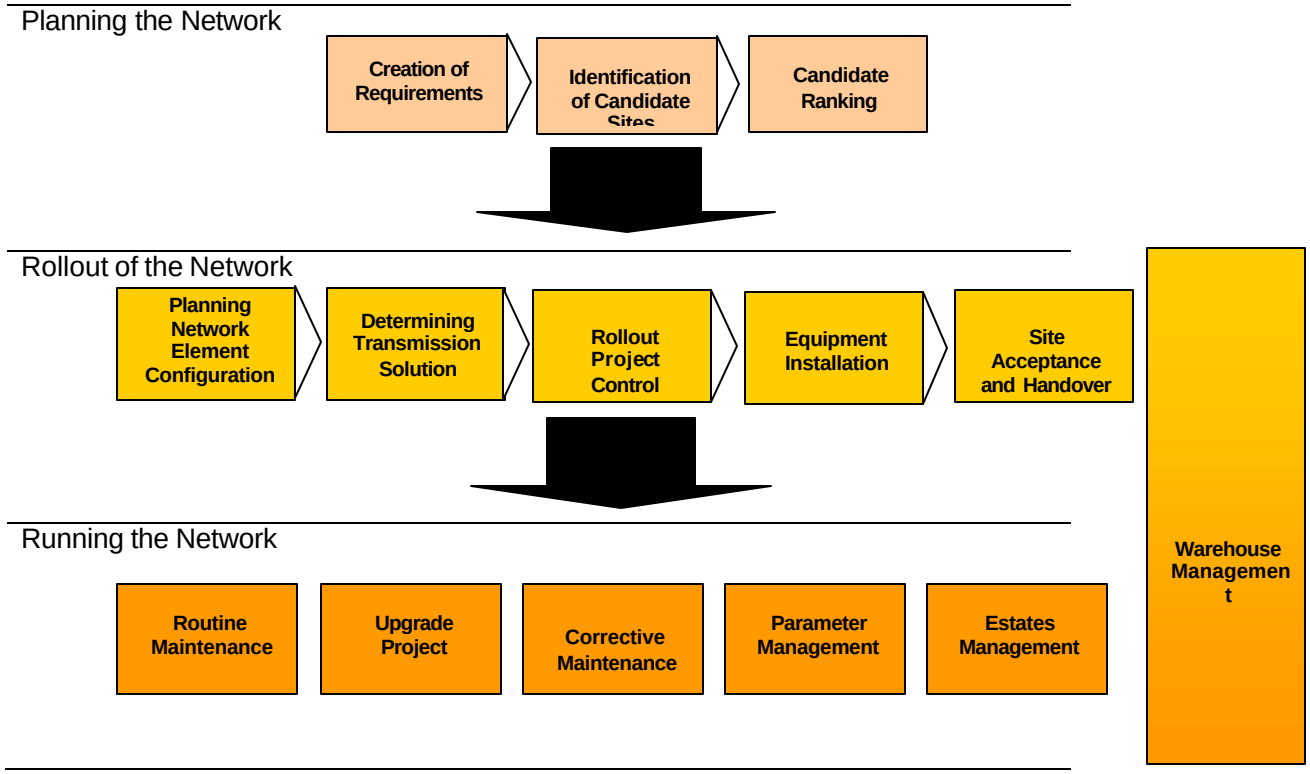
The points of acceptance can also be configured to different milestones within the project plan, so that the overall progress and milestone dates can be recorded and be easily accessible. CONSTRUCTO also allows milestones to be

set up to relate to the successful completion of a Snag List. The Snag List module allows the management of different kinds of acceptance by coordinating the passing of many criteria, and representing the overall acceptance of the Snag List with a header status. The Snag List is also versioned to allow for reattempting the acceptance check if the first version fails to pass all the items. Therefore, the acceptance process for a particular milestone can have many items to pass, and many iterations to attempt its acceptance, but the final outcome will be the completion of a single milestone.

6. RUNNING OF THE NETWORK

The CONSISTEL software products used in this chapter are:

- OPERIS
- CONSTRUCTO
- SPECTO
- MOTIO



6.1. Routine Maintenance

6.1.1. Project control for maintenance tasks

OPERIS allows complete control over every maintenance activity carried out on the Network. Using the Planned Orders module contained within OPERIS, it is possible to create and manage maintenance jobs and the tasks that are required to carry them out. It is possible to configure as many project plan templates for all of the different maintenance job types as required, and for each of them the different tasks and processes can be associated. The same project control functionality is available as described in the Network Rollout chapter. The tasks within the project plans have dependencies defined between them, which allow them to be executed at the correct time so that engineers know to complete them. This allows tasks that cannot be commenced because preceding tasks have not been completed, to be restricted from the queues view, in order to give a clear representation of the work that is currently underway. Each of the tasks in the plan also has a duration applied and the dependencies are used in the calculation of forecasted dates.

6.1.2. Automatic scheduling of routine maintenance

To minimise the workload for routine maintenance, the application also supports the ability to auto-create maintenance jobs on a scheduled basis. For example, an air-conditioning maintenance task may be created automatically every 6 months for every site.

Because the different categories and definitions of the routine maintenance jobs can be set up easily, it allows OPERIS to fully control all of the maintenance tasks and therefore giving complete visibility of the work that is being undertaken on the network.

6.2. Upgrade Project Control

6.2.1. Manage any kind of Upgrade

Another function within the Operations department is the optimisation and upgrading of the network. Using the Planned Orders module of OPERIS, it is possible to configure many different kinds of upgrade project with different project plan templates. Upgrades can vary dramatically in complexity, and the Planned Orders module caters for all kinds of upgrade, using the full project control functionality available in the application. The variety of different project types spans from small projects like antenna tilt adjustment, or optimisation of network parameters, up to equipment changes like TRX upgrades, and even complex projects involving civil works. The project plans can be defined to show the full upgrade process, and using this process can calculate forecast dates for later activities and also correctly execute the tasks when they are due for completion. Assignments can be made so every task has

an engineer responsible for its completion, and the milestones are linked closely with EFFECTO for progress reporting.

6.2.2. Protecting data integrity for the "Live" network

As well as managing the progress of upgrades, an important factor for the system is to be able to maintain data integrity. While the upgrade is being planned it is necessary to record what changes the upgrade will apply; both to the configuration of the network element, and to the component equipment list. However, if the network element itself were updated, the system would then be inaccurate for operations staff requiring information about the current live network element.

OPERIS solves this issue by creating and managing a new "Planned" version of the network element and associating it with the Planned Order. This allows the upgrade to be designed using the new planned record, and any fields and equipment can be altered against this version without affecting the live record. The Planned Order also shows a summary view of the equipment changes between the two versions to demonstrate exactly what work is being carried out in a very clear representation. During this time the "Live" network element remains in place and an accurate representation of the network is always present. When the upgrade is completed, the application automatically controls the status and version transition process, so that following the Planned Order the Live network element is now shown with the amendments of the upgrade applied.

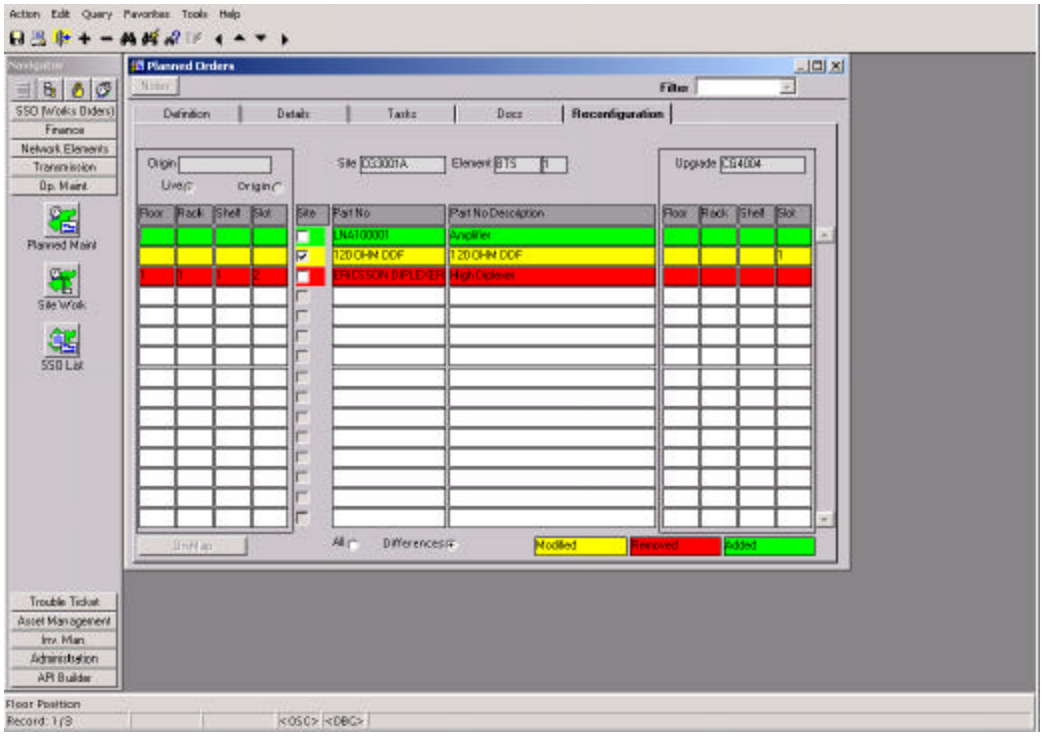


Figure: Upgrade planned orders reconfiguration screen – showing equipment differences between Network Element versions

6.3. Corrective Maintenance

6.3.1. Recording Trouble Tickets

The Trouble Tickets module of OPERIS provides an area to record any failures within the network, and also defines the resolution path and SLA for each of the different kinds of fault. Many different kinds of faults can be set up within Trouble Tickets, and each one will have a series of actions that need to be completed in order to manage a resolution. Each of these actions can also have a response time assigned, so that average resolution forecasts are available for any customer feedback relating to the failure.

6.3.2. Notification of trouble tickets to engineers

Trouble Tickets will arrive any time of day or night, and accordingly, the notifications to the engineers can be sent by email or SMS. The SMS messages will indicate the Trouble Ticket number and some basic information about the fault. Further details can be viewed via logging into OPERIS over the web or using the WAP interface.

6.3.3. How do you protect SLA's?

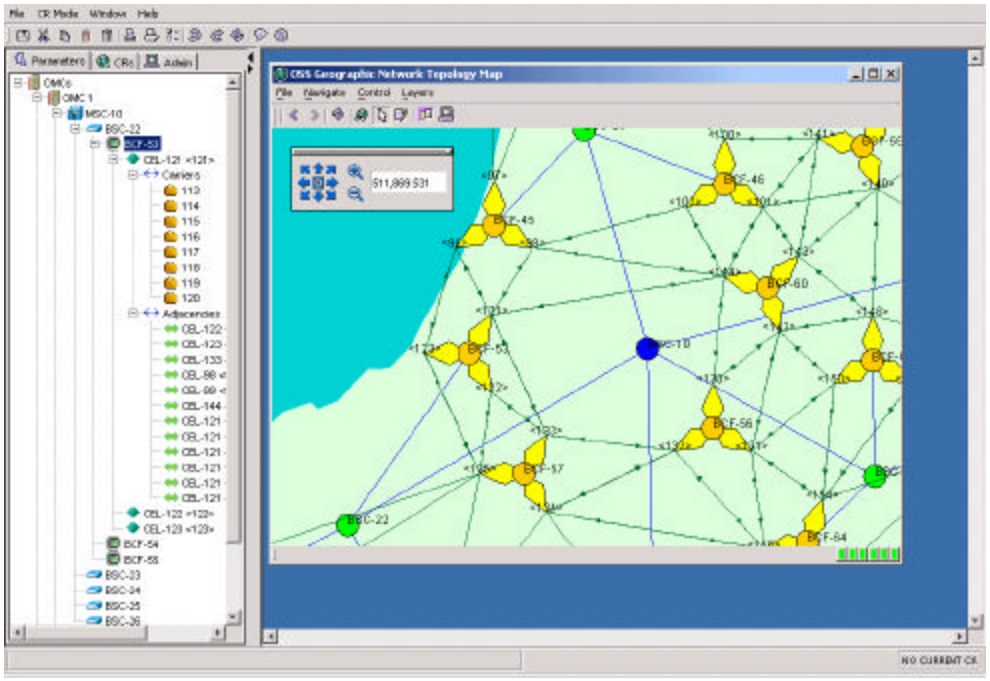
Where SLA's are not met, Escalations ensure that other colleagues or managers are informed of the delay. OPERIS allows the escalations to be defined for each different action with their own rules, so that some critical escalation paths might inform a superior level once an hour, where other less critical faults may only prompt a notification once a day.

6.3.4. Visibility of work and the Site Diary

One advantage of the single database, integrated approach of CONSISTEL software products is the visibility of work against the site. The Site Diary in CONSTRUCTO will display all work carried out against the site from the Trouble Tickets, Planned Orders and Works Orders module. Using the application fully there should be no work carried out on a site that is not managed and recorded within CONSTRUCTO or OPERIS. This provides significant benefit for both time management and fault resolution. For example, an engineer responding to a trouble ticket against a site that is a three hour drive, can first view the site diary to see what other activities are planned. If over the next few days a TRX upgrade and a Health and Safety inspection are also scheduled, then all three activities can be completed with a single visit; potentially saving two six hour drives. Another example could be that a trouble ticket is raised against a network element, and using the site diary it is immediately evident that at the same time another engineer carried out some parameter changes against the OMC, and so providing a possible avenue for the fault investigation.

6.4. Parameter Management

6.4.1. Applying Changes to the OMC

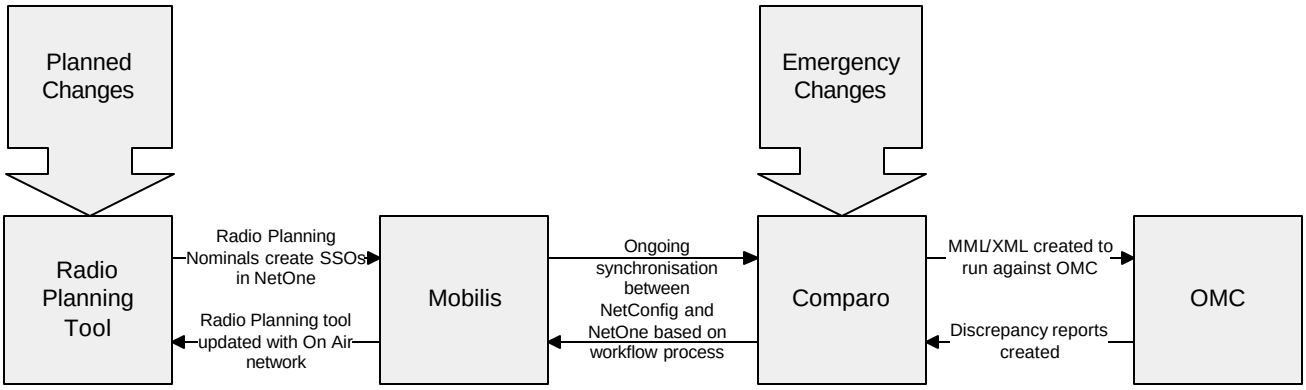


COMPARO provides an environment where all optimisation changes across the network can be performed. The database is linked as the final part of a complete end-to-end process, so that radio parameter changes are incorporated into the other build and upgrade processes managed by Mobilis. Planned changes originally designed within the radio planning tool are passed to COMPARO, and following authorisation of the change the MML or XML is automatically created, to be run against the OMC. This minimises time spent creating this code and reduces human error in the process.

6.4.2. Planning against accurate network data

A daily synchronisation between the OMC and COMPARO checks for any discrepancy between the Live network and the authorised parameter set. This controls the process to ensure that the data entered on the OMC is reconciled correctly with the authorised parameters in COMPARO, and any discrepancy can be corrected using the same automated mechanism.

Additionally, the live network data can be passed back to the radio-planning tool, ensuring that the planning team has accurate information including all recent operational changes to the network.



6.5. Estates Management

TENEO is a complete estates management solution, which offers a structured overview of key interest terms surrounding the management of estates in a single database repository. Items such as repairing obligations, use restrictions, rent review options and break clause types can all be viewed from a single source, enabling for more efficient estates management. Within TENEO information against a site can be stored via a unique site identifier and is then immediately available to enable the efficient retrieval of rental contracts, rental renewal notices, service supplier contracts, contact retails for landlords, etc.

TENEO also maintains a complete rental history allowing for all negotiations to be tracked and stored, with one of the key benefits of using TENEO being operators are actually forewarned of pending contract renewals allowing for early re-negotiation of contracts and plenty of preparation.

TENEO is part of the Mobilis suite of telecommunications specific applications. TENEO can be installed independently or as a component within the overall Mobilis architecture. The flexibility to ensure that TENEO is capable of being customised and deployed to meet the individual requirements of varied operational networks has been incorporated into the design and development of the system. TENEO is designed to tightly integrate with other network

management solutions and this combination of products ensures that the network operator can implement best of breed solutions to meet their network requirements.

7. WAREHOUSE MANAGEMENT

7.1.1. Ordering equipment

Ordering stock requires authorisation from a suitable position within the organisation. MOTIO allows the ordering of stock using the Parts Requisition module. This defines a Header record showing information like the supplier and store that the order is made from, and a Lines section that lists each part type that is ordered and its quantity. Different privileges are required to create the requisition and to authorise it based on status transitions, and additionally different users have individual maximum values that they are able to authorise.

7.1.2. Financial integration

Obviously it is important that the warehouse management system is linked closely with the financial systems of the organisation so that equipment is paid for. The Parts Requisitions module in MOTIO is designed as an interface point to the financial systems to pass that an order has been requested for the purpose of creating purchase orders. CONSISTEL software products have successful interfaces operating with SAP and Oracle Financials.

7.1.3. Receiving goods into the warehouse

The next stage in the equipment lifecycle following the Purchase Order is the delivery of the equipment at the warehouse. The Receipt module of MOTIO records the arrival of goods and matches the receipt against a requisition record. The receipt then records the packing slip details that were supplied with the delivery. The Requisition lists what was ordered from the supplier, the packing slip lists what the supplier believes they have delivered. This allows for amendments between the two versions for errors or stock shortages. The final version to be recorded is what was actually delivered, and the Receipt module records the counts of the equipment as carried out by the warehouse staff.

The Receipt module also provides a second interface point for the purpose of invoice matching with the financial system.

It is possible for high value goods to enforce additional quality checking against the receipts to ensure the counts are correct and that they arrived in good condition. This quality Receipt Inspection has to be entered separately to the receipt record and before the receipt transaction can be completed.

7.1.4. Moving and installing equipment

The warehouse management system is linked directly with the asset system so that stocks can be moved directly into the operational environment. All of the stock movement and receipt functions can be interfaced with scanning equipment to increase data entry speed and accuracy. This seamless link with the OPERIS and CONSTRUCTO applications, along with the provision for financial integration, is why MOTIO provides the bridge between engineering and finance.