Safe harbor

Neither the information nor any opinion expressed in this presentation constitutes an offer, or invitation to make an offer, or to buy any security issued by the company. This presentation contains predictions, estimates or other information regarding the Company’s operations which are forward looking in nature. While these forward looking statements represent our best current judgment on what the future holds, they are subject to risks and uncertainties that could cause actual results to differ materially and may involve risk and uncertainty. This presentation is prepared for general purposes only and does not have any regard to the specific investment objectives, financial situation and particular needs of any specific person. No liability for any loss will arise with the company as a result of the action taken on the basis of information contained herein.

For a discussion of the risks and uncertainties that may cause results to differ, you should review GTL’s filings with stock exchanges, including the annual report and quarterly disclosures.
Imperatives for Optimisation

- RF optimisation remains one of the key challenges in any network.
- Identifying potential faults in the network and resolving them before they affect network performance.
- Rectifying causes of faults affecting network performance.
- Leads to efficient use of the spectrum.
Optimisation Overview

What is Optimisation

Optimisation is the fine-tuning of a nominal cell plan to a real environment.

Objective

To achieve 100% compliance to

i) The design criteria in regards to coverage, capacity and quality.

ii) The standards defined by local government authority.
Need for optimisation

Network issues that may generate a requirement

Perceived reduction in network quality.
- Indications from network performance monitoring.
- Subscriber's experience of using the network.

Maximising the use of existing infrastructure.
- Operators want to ensure the best returns on investment.

Introduction of new services.
- Maximise existing resources to accommodate new services such as GPRS.
- Change in original design parameters.
  - Flawed original design in format.
  - Original design information has changed.
Network Lifecycle

- Licence Award
- Network Planning
- Network Rollout
- Continuous Optimisation
- Pre Launch Optimisation
- Swap Management

(If required)
RF Optimisation

- BTS upgrade - BTS re-homing - BSC re-parenting - Transmission Re-engineering
  (If required)

Pre Launch Optimisation

Continuous Optimisation

Virtual Optimisation Centre
Pre Launch Optimisation

Objectives

- High rate of integrations
- Low traffic (Pre-launch or launch)
- Predominantly drive data dependant

Pre Launch Optimisation

Continuous Optimisation

Swap Management
Optimisation Process – Single site verification

- Pre Launch Optimisation
- Site Identification
- RF Site Audit
- Coverage Verification
- Parameter Verification
- Site Acceptance
- Fail
- Pass
- Problem Analysis
- Reconfiguration
- Continuous Optimisation
- Swap Management
Optimisation Process – Drive Test Based

Pre Launch Optimisation

Cluster Identification

Site Identification

Site Acceptance

Cluster Stimulation

Cluster Preparation

Drive Test

Data Analysis

Reconfiguration

Problem Analysis

Swap Management

Cluster Analysis

Pass

Fail
Cluster Analysis

OMC Data

Drive Test Results

Handover Zones

Interference Regions

Poor Coverage Regions

Call Quality Performance

Simulation Data

Determine clusters for acceptance

Characterise performance

Ensure correct site configuration

- Parameter Setting
- Neighbors
- Powered
- Stable

Drive tests

Process data

- Call statistics
- Key measurement events
- Neighbor analysis
- Key measurement data

Analysis

Remodelling

Reconfiguration

- Parameters
- Neighbors
- Report Hardware Requirements
Cluster Reconfiguration

- **Pre Launch Optimisation**
- **Continuous Optimisation**
- **Swap Management**

**Hardware Optimisation**
- Antenna Reorientation
- Antenna Down tilt
- Antenna Relocation
- Antenna Height adjustment
- Masthead Amplifiers

**Cell parameter optimisation**
- Handover parameters
- Power planning
- Neighbour list reconfiguration
- Frequency planning

**Performance Monitoring**
Pre Launch Optimization

What GTL can do for you

Pre Launch Optimisation
- Parameter Analysis
- Process Creation
- KPI Definition
- KPI Reporting
- Functionality Asses
- Training
- Config Management

Continuous Optimisation
- Cluster Identification
- Cluster Preparation
- Drive Testing
- Drive Analysis
- Modelling
- Network Reconfigure
- Cluster Monitoring
- Model Calibration

Swap Management
KPI’s to be Monitored
Based on performance of a Network & Cell (TBD : To Be Decided)

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Reports

**Pre Launch Optimisation**

- Cell / Cluster Drive Test and Analysis Report.
  - Quality issues identification and RX lev, RX Qual, TCH Blocking, SDCCH Drop, HO Issues, Call drop problems, and call set up issues analysis.

**Continuous Optimisation**

  - RF parameters audit and tuning: neighbour site list, power parameters, HO parameters, etc.

- Antenna engineering tuning.

**Swap Management**

- Cell / cluster Optimisation and tuning to reach acceptance criteria.

**Deliverables**
Reports

**Pre Launch Optimisation**
- Cell, cluster, Network drive test reports from post processing tool.

**Continuous Optimisation**
- Network Analysis and Optimisation Report.
- RF coverage and quality assessment report.
- Radio and system Parameters audit and tuning report.
- Optimisation Report.
- Acceptance Report.

**Swap Management**
- Interference Measurement.
- Updated network site database.
Continuous Optimisation

**Objectives**

- Maintaining the traffic rate within medium to low
- To achieve more stability in neighbour/ pilot
- Minimisation of integration Issues
- Reducing operational cost
- Predominantly OMC R Stats and Counters
Optimisation Process – Drive Test Based

Pre Launch Optimisation

Continuous Optimisation

Swap Management

Determine clusters for acceptance

Characterise performance

Ensure correct site configuration
  - Parameter Setting
  - Neighbors
  - Powered
  - Stable

Drive tests

Process data
  - Call statistics
  - Key measurement events
  - Neighbor analysis
  - Key measurement data

Analysis

Remodelling

Reconfiguration
  - Parameters
  - Neighbors
  - Report Hardware Requirements
Cluster Reconfiguration

Pre Launch Optimisation

Hardware Optimisation
- Antenna Reorientation
- Antenna Down tilt
- Antenna Relocation
- Antenna Height adjustment
- Masthead Amplifiers

Cell parameter optimisation
- Handover parameters
- Power planning
- Neighbour list reconfiguration
- Frequency planning

Continuous Optimisation

Swap Management

Performance Monitoring
Continuous Optimization

Pre Launch Optimisation

Continuous Optimisation

Swap Management

What GTL can do for you

Audit
Benchmarking
Process Control
Config Management
KPI Definition
KPI Reporting
Functionality Assess
Training

OMC Reporting
Cell Prioritisation
Fault Resolution
Drive testing
Change recommend
Network Reconfigure
## KPI’s to be Monitored
Based on performance of a Network & Cell

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Reports

**Deliverables**

- **Pre Launch Optimisation**
- **Continuous Optimisation**
- **Swap Management**

**Continuous Optimisation**

- Radio network measurement and analysis report
  - Containing signal strength, Quality, Time advance, Path loss, Frequency distribution, Neighbour selection.

- BSS/ RAN parameter adjustment report

- Neighbour optimisation parameter, BTS/ MS power control, Intracell handover, Hierarchy cell structure & cell load sharing.
Reports

Pre Launch Optimisation
- Worst cell optimization report
  - TCH Blocking, SDCCH Blocking, Signal Strength, Bad Quality, Timing Advance, Sudden Loss, Other Reasons.

Continuous Optimisation
- Coverage Analysis report
- Drive test, Worst cell, site survey, Antenna rigging.

Swap Management
- Capacity Analysis & Recommendation Report
  - Dynamic full and half rate, Cell load sharing, Hierarchy cell structure, Dynamic allocation of SDCCH.
Swap Management

Objectives

- High rate of integrations
- High traffic (Pre-Cut and Post Cut)
- Predominantly drive data dependant

Pre Launch Optimisation

Continuous Optimisation

Swap Management
Swap Management

- Pre Launch Optimisation
- Continuous Optimisation
- Swap Management

- Swap Planning
- Default Parameter
- Parameter Mapping
- Validation of Neighbour, BSIC and MAIO
Swap Process – Pre / Post verification

- Pre Launch Optimisation
- Site Identification
- RF Site Audit
- Coverage Verification
- Parameter verification
- Site Acceptance
- Fail
- Pass
- Continuous Optimisation
- Swap Management
- Reconfiguration
- Problem Analysis
Swap Process – Cluster Based

- Pre Launch Optimisation
  - Cluster Identification
  - Cluster Stimulation
  - Cluster Preparation
  - Drive Test
  - Data Analysis

- Continuous Optimisation
  - Site Acceptance
  - Site Identification
  - Problem Analysis

- Swap Management
  - Reconfiguration
  - Cluster Analysis
  - Pass
  - Fail
Cluster Analysis

Drive Test Results

OMC Data

Determine clusters for acceptance
Characterise performance
Ensure correct site configuration

Drive tests

Process data

Analysis

Remodelling

Reconfiguration

Parameters
Neighbors
Report Hardware Requirements

Handover Zones
Interference Regions
Poor Coverage Regions
Call Quality Performance

Simulation Data
Cluster Reconfiguration

Pre Launch Optimisation

Continuous Optimisation

Swap Management

Hardware Optimisation

- Antenna Reorientation
- Antenna Down tilt
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- Antenna Height adjustment
- Masthead Amplifiers

Cell parameter optimisation

- Handover parameters
- Power planning
- Neighbour list reconfiguration

Performance Monitoring
Swap Optimization

Pre Launch Optimisation
- Parameter Analysis
- Process Creation
- KPI Definition
- KPI Reporting
- Functionality Assessment
- Training
- Config Management

Continuous Optimisation
- Off Site
- Drive Testing
- Drive Analysis
- Modelling
- Network Reconfigure

Swap Management
- On Site
- Cluster Identification
- Cluster Preparation
- Drive Testing
- Drive Analysis
- Modelling
- Network Reconfigure
- Cluster Monitoring
- Model Calibration

What GTL can do for you
## KPI’s to be Monitored
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Reports

**Pre Launch Optimisation**
- Swap Management
  - Swap Planning Report.
  - Parameter mapping report

**Continuous Optimisation**
- Pre Drive Test Report
- Verification of RF Coverage, parameters audit and tuning: neighbour site list, Power parameters, HO parameters, etc.
- Cutover Drive Test Report
- Validation of RF Coverage, parameters audit and tuning: neighbour site list, power parameters, HO parameters, etc.

**Swap Management**
- Post Drive Test Report
- Improvement of RF Coverage, parameters audit and tuning: neighbour site list, power parameters, HO parameters, etc.
Subjects to Investigate

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<th>Pre Launch Optimisation</th>
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<td>Disabled GPRS</td>
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<td>Overshooting sites – coverage overlaps</td>
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Subjects to Investigate

Pre Launch Optimisation
- One-way neighbors
- Ping-Pong Handovers
- Not happening handovers
- Footprint and performance of the site as per design criteria

Continuous Optimisation
- Faulty Installations
- Sites not operational
- Faulty TRX
- BA list error
- BSIC, HSN, MAIO Plan
- Hopping ON or OFF

Swap Management
Recommendations

Pre Launch Optimisation
- Defining missing neighbor relations
- Proposing new sites or sector additions
- Proposing antenna azimuth changes
- Proposing antenna tilt changes
- Proposing antenna type changes
- BTS Equipment/Filter change
- Re-tuning of interfered frequencies
- Adjusting HO Margins
- Adjusting accessibility parameters
- Changing power parameters
- MHA/TMA adds

Continuous Optimisation

Swap Management
Remote Analytics for Design, Planning & Optimisation to achieve minimal startup time, consistent use of process and tools and concentrated expertise in one location.

State of the art **VPO Centre** vital stats:

- Floor space: 2000 Sq. Ft.
- Seating capacity: 50
- Internet speed: 2 Mbps
- No. of RF engineers: 50
- Total man years experience: 10 Years
- Tools used for VPO: Asset Connect PL4 & MIPT
Low fixed Cost regardless of the project location.

Fast Delivery Cycle and Quick deployment of project.

Cost effective especially for high cost areas.

Flexible service packages to meet unique customer needs.

Ideal solution for high-risk or hard to access areas.

Expertise availability guaranteed.

Core expertise group available to service multiple project.

Quick take off without time lag to mobilize.

Uniform applications on tolls through standard processes.
Value Proposition

- Risk Sharing - KPI & SLA Based Commitments
- End to End RF solution provider
- RF Planning, Design and Optimisation done for 31 networks
  - Experience across 15 geographies
  - Covering 2G, 2.5G, 3G technologies
  - Across standards such as GSM, Edge/GPRS, CDMA, UMTS and WiMAX
- Long Standing relations With OEMs At Global Level
- Unique combination of tasks carried out Offshore and Onshore that give cost efficiencies
- Technology and vendor agnostic skill set
Case Studies & Capabilities
Case Study 1

About the Client:
Hutchison Essar (Hutch), is a leading GSM network operator in India having GSM wireless operations with a pan Indian footprint. The network has been growing at a very high pace to address competition with more coverage and capacity. This entails Hutch to roll out new sites in remote areas of UP. While expanding, Hutch wanted to have their network optimised.

Business Challenge:
Hutch found RF Group of GTL a competent partner to perform on their behalf optimization activities with quality deliverables. In the process GTL got the responsibility of around 240 sites (170 existing & 70 new sites) to be completed during October 2005 to March 2006.

Project Scope:
GTL was to optimize new roll out cell sites in the network to achieve desired results viz. call origination, call termination, intra-cell handover, and coverage.

On many occasions, it has been found that improper RF cabling gave rise to wrong BCCH - Sector combination. Corrections were initiated and post correction verifications have been performed.

To find coverage footprint and associated quality plt, drive tests were executed with two MS (MS 1-Hutch Idle mode & MS 2 – Hutch Dedicated mode) simultaneously.

This were done in and around 6km radius centering the site as per Hutch specification.

From this drive-test data, GTL prepared coverage and quality plot for newly commissioned site. Results were submitted to Hutch. After achieving required results, sites were put on air for commercial purposes.

Value Delivered:
GTL successfully completed the optimisation activity for the project covered 170 existing sites and 70 new sites during Oct’05 to Mar’06. All sites were either in Highways or in remote locations of eastern part of UP covering Kanpur, Lucknow, Varanasi, Allahabad and Gorakhpur.
About the Client:
Hutch is one of the leading gsm operator in India having licenses spanning all over India. Hutch is working with gsm 900 band and wants to expand their network as the demand grow. So to meet quality and coverage there is need to swap old ZTE system with some new updated system, which can support the gsm, gprs, edge and easily upgraded to 3G. Hutch selected Nokia as OEM for the core part of their network.

Business Challenge:
Nokia wanted to have resources in the outsourcing domain increase their strength. As GTL had done lots of work with Nokia in India so GTL seems to be perfectly poised to rise to the need. We became partner of choice for Nokia to perform RF tasks in the swap roll out process. From March 2005 to Till Date for performed allocated tasks creditably. A few points of project:
- GSM 900 Networks.
- 45 sites to be swap from ZTE to Nokia.
- 342 New Nokia Ultra BTS
- Coverage includes cities and boundaries.
- Network with 19 BSC’s and two switch AXE 10 from Nokia.
- CSSR ≥94%, SDCCH Drop ≥2%, Handover success rate ≥ 94%, Call drop rate ≤ 2.5%.

Project Scope:
SoW conferred and accepted by GTL have been as follows:
- Perform pre swap drive test for all 41 sites.
- Prepared proficient database for Nokia
- Add and delete Neighbor list.
- Verification of antenna locations and azimuth.
- Verifies existing Frequency Plan, recommend the changes required.
- Download the database to OMC and verify the dump.
- Perform Drive Tests for sites verification on Swap night.
- Perform the post swap drive test for all 45 sites.
- Conduct Acceptance Test Procedure (ATP) with end customer.
- Nominal Cell Planning for New 417 sites
- RF survey, LOS survey and Drive Test for New Sites.
- MW radio link planning for MW transmission links.
- Provide a solution for the Hutch subscriber’s complaints.
- Preparation of 2 Mbit/s transmission plan including link capacity calculations, timeslot allocation and ET planning.
- Maintain the Network quality by daily monitoring KPI.

Value Delivered:
All swaps are mostly conducted at night there is around 6 sites swap per day. As soon as swap sites bring on air our drive test is ask to conduct the site verification drive test at each cell the test includes database verification, sector swapping, handheld testing, neighbor list verification, call termination. After finishing the swap now optimization is started on network level, to meet the KPI daily statistic report are generated with the help of Business object and results are discussed with the customer and also suggest the necessary changes.
GTL's Network Customer Engagement
International Presence

Americas:
- US

Europe:
- UK
- France
- Ireland
- Sweden
- Switzerland

Middle East:
- UAE
- KSA
- Oman
- Qatar
- Kuwait

Asia–Pacific:
- Malaysia
- Thailand
- China
- Taiwan
- Indonesia
- Australia
- Singapore
- Philippines
- New Zealand

South Asia
- India
- Nepal
- Bhutan
- Maldives
- Sri Lanka
- Bangladesh

Africa:
- Nigeria
- South Africa
- Guinea Conakry
- Mauritius

- International Office
- Projects Undertaken
Thank you