

## Competencies group

Engineering Knowledge  
Managing engineering work  
Professional acumen  
Developing technical solution

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### Work Record#1 NICE4 project

NICE4 project covers all competency groups. My acquired knowledge was obtained mainly from practicing the role of telecom engineer, backed up with previous mentioned theoretical knowledge and tools gained from the university. I am experienced in the project implementation with the consideration of the safety, economical and ethical issues, skills that I acquired in the university. I among others where I considered safety and ethical issues touching implementation team and people living in the project neighborhood.

I acquired investigative and troubleshooting skills that I have used to find the solution to the problems that I encountered daily in operations and projects activities. I have good knowledge in the use of the mathematics and conceptual models that I acquired in my studies and I have applied in NICE4 project. I was involved in risk assessment, design, innovation, project management, troubleshooting complex engineering issues during deployment, configuration and commissioning. I have been involved in complex engineering activities, making decision and managing all or part of it.

One complex engineering problem I have taken responsibility to make decision for NICE4 project like which equipment and technology is useful and compatible with the existing telecom infrastructure. I have gone through different vendors and technologies. Finally, I've decided the CIENA is more suitable along with ethernet technology, implemented successfully.

Sample

NICE4 Technology Discussion.docx

I was involved in research, designing, investigating, deploying and implementing. Initially I identified the need for the specific engineering design project, identified and differentiate the design project constraints and requirements. Based on existing infrastructure information and gather more information from vendors I'd developed design for the CIENA Network.

Sample:

NICE4 Network Carrier Ethernet Equipment LLD v2.22 (Low level design document)

HPO040240 - Horopito Sigs v1.0.pdf (it shows the Horopito signal site design)

I must follow the ethical code of conduct like straightforward and honest, Trustworthy, loyal, respect for others, adherence to the law, doing good and avoid harm to other, confidentiality. Health and safety is on top priority in KiwiRail environment. In KiwiRail we must do health and safety discussion which is on priority in the meetings. Before visiting site, we must follow and submit the safety discussion form. I use PPE while site visit and follow STAT (Stop, act, think and review).

I did communicate effectively with internal stake holders and third parties in terms of network changes, teams' alignment to carry out different activities through change management process.

There were some environmental constraints which I highlighted during the design. As electronic system doesn't have direct impact on the environment except one factor which is heat dissipation from the electronic circuit so recommended to put in air conditioning room.

This project had a positive social impact for certain people which includes external stakeholders as their contract had been extended. It created jobs for new field technicians.

### Activity / project description

The project was for KiwiRail National Train Control Centre (NTCC). The NICE4 project was tasked with replacing the current Nokia FOTS and fibre cable on the North Island Main Trunk (NIMT) railway line between Palmerston North and Auckland.

The outcome of this project is to provide robust KiwiRail fiber infrastructure network and to improve the train control data and voice communications network to enable the safe and reliable operation of the rail service.

The other stakeholders were ICT providing the backbone connectivity to KiwiRail telecom devices and Third parties for fiber deployment. KiwiRail internal stakeholders (field technical teams, KiwiRail telecom and project team).

KiwiRail will have access to several fibres within the new cable route. The existing NIFOTS fibre route will remain in place and about 3 or 4 of the major nodes can potentially provide capability for link/ring diversity.

We have had technical discussions with several vendors to highlight what technologies may be suitable to implement a new data network using the new fibre capability. There are two main technologies that have proposed to form the building blocks of a new network:

- a) Ethernet Ring Protection providing layer 2 Carrier Ethernet Services
- b) MPLS-TP meshed network providing layer 2 Carrier Ethernet Services

After discussion with several vendors, it would seem wise to choose a network technology that allowed us to progressively upgrade existing network infrastructure with the new technology while still providing connectivity to legacy systems. It is desirable that the addition of ethernet services can be easily be deployed preferably via a network management system, and that operational maintenance is simplified. Finally, we have decided to choose ethernet ring protection providing layer 2 carrier ethernet services technology with CIENA (vendor) based on our technical requirements, easy to deploy, configuration and commissioning.

### Role description

I was involved in telecom network design and implementation, responsible for CIENA network design, deployment, configuration, Commissioning and acceptance. CIENA servers (primary and secondary) installation and commissioning, Remote Telemetry Unit (Kingfisher) deployment, configuration and testing.

The tasks which I have specifically performed:

- Kingfisher (Remote Telemetry Unit) configuration and testing at wiring shop before deployment into the production environment.
- Review and validate CIENA network design
- Review and validate sites design and configuration
- Review and validate rings design and configuration.
- CIENA hardware shipments receiving from overseas and delivering to respective areas

- Coordination and communication with field teams, CIENA support teams, ICT Team.
- CIENA NMS client installation (Primary and secondary) and acceptance.
- Identification and rectification of issues while CIENA devices deployment.
- Produced Acceptance documents (CATP) for NMS, Rings, Sites, Hardware.
- Identification issues while CATP (CIENA acceptance test procedure) of NMS tool and devices configuration, logging case with vendor and follow up.
- End-to-End fibre links testing, identifying fibre loss, escalation and follow up.
- Network Change control process and implementation during sites cutover.
- Acceptance progress report.
- Maintaining and keeping record for CATP documents (Hardware acceptance, load-soak test, MS testing, Rings, Sites) after final approval from head of department. Maintaining record for network inventories, network design, site design, LLD, end-to-end fibre connectivity design.
- CIENA spare parts arrangements, documentation and delivered to respective regions.
- The other work which I was involved with SPARK (ICT) team as Spark ICT team is responsible for KiwiRail virtual infrastructure.
- Coordination with ICT regarding jump hosts servers (PDJNMS01 and PDJNMS02) installations as jump hosts servers are in virtual infrastructure which is managed by Spark team, verification of all installed software as per our requirements.
- Upgrade jump hosts from window 2012 to window 2016 after CIENA NMS validation on test jump host server with window 2016.
- Coordination with CIENA Support team for:
- CIENA NMS upgrade to 6.4 version to mitigate issues in old version
- Escalating issues during deployment and follow up.

#### **Work Record#2: Disaster recovery site project**

This project mainly covers the engineering knowledge, managing engineering work and developing technical solution. I have taken the responsibility for the risk assessment, auditing, design, innovation, project management, stakeholders' liaison for Disaster Recovery project KiwiRail.

I have been practicing in the specialist field of Networking, testing, design, systems configurations and safety concerns.

This project involved complex engineering problem which was outside of problems encompassed by standards and codes for voice traffic recording. There was no obvious solution and originality was required in the problem-solving phase of the project.

I could not have produced the voice recording (incoming and outgoing) without an in depth knowledge and engineering complexities involved, which was gained by my personal research, organized and facilitated by me.

I took critical decision in DR project regarding the voice recording server. I have recommended application for voice recording which was tested and implemented successfully. This was the interim solution, later we have installed a voice recording server.

Sample

Decant DR Project\_Radio Voice Recording

I did communicate effectively with internal stake holders and third parties in terms of network changes, teams' alignment to carry out different activities through change management process.

One of my engineering problems stems from a large disconnect in communication between relevant telecom and operations stakeholders. There was a communication gap between operations and other stakeholders during the change in the telecommunication and signal network. As a strategy to break down these communication barriers between operations and other stakeholders I produced a document "Task Instruction KiwiRail\_ChangeManagement\_Process\_Ver0.2.docx" for the change management process and setup a meeting to demonstrate how to proceed with the change management. This new innovative process was very successful in achieving its goals. I have taken responsibility to implement the change management process based on my previous experience and we have reduced significant number of unexpected outages. The sample evidence shows how I have taken responsibility for fostering better collaboration and communication between operations and all telecom and signals stakeholders in New Zealand.

Samples:

Task Instruction KiwiRail\_ChangeManagement\_Process\_Ver0.2.docx

### Activity / project description

KiwiRail was committed to developing a Disaster Recovery (DR) Centre as a backup centre in case the National Train Control Centre (NTCC) is lost in an uncontrolled event. This project was focused on the Palmerston North DR centre and Auckland DR Centre creating a complete list of required items for the sites, testing requirements and commissioning the sites.

KiwiRail developed a standby disaster recovery Train Control centre in Palmerston North and Auckland which can be activated within 24 hours if the Wellington Railway Station becomes unusable for an extended period.

The stake holders were Network and Access control, Engineering Services, ICT(Spark) corporate and field support team.

Change control was performed through Network access control, ICT team was responsible for corporate network installation and commissioning whereas engineering services (Signal & Telecom) was responsible for realflex, Radio and Rail9000 systems installation, commissioning and testing.

### Role description

I was involved in project meetings, design, plans, requirements and safety concerns. My responsibilities were to gather information regarding realflex, RADIO and Rail9000 systems hardware, software and compatibility systems with applications, design, layouts, systems delivering on sites, change process implementations, manage field support teams and testing software's testing.

The tasks which I have performed are:

- Design/layouts
- Prepare list for IP's for the systems (Real flex and Radio)
- ICT team coordination to configure the systems (Real flex & Radio) as per customer requirement.

- Realflex application installation into the Real flex systems.
- TRACS3 application installation into the Radio Systems.
- Delivering systems on the sites (Palmerston north and Auckland) and coordination with field teams.
- LAN connectivity, cabling as per design layout.
- Installation Realflex and Radio workstations at Palmerston north and powered up.
- Performed successful testing for real flex and Radio machine at Palmerston north.
- Installation of Real flex, Radio and R9K workstations at Auckland DR centre.
- Performed testing for all systems at Auckland
- Performed Radio Voice testing
- Labeling all device and screens accordingly.
- Documentation and hand over to operation.

### Work Record#3: NTCC infrastructure upgrade project

This project covers the engineering knowledge and managing engineering work . i was involved in coordination, change management, design, decision making in terms of hardware and software application compatibility. Multiple applications installation and testing.

#### Activity / project description

This project was related to upgrade KiwiRail National Train Control Centre infrastructure in Bunny Street Wellington, there are number of desktop workstations that serve as the operator interface for control and radio network. These workstations operate 24x365.

The main purpose of this project is to replace obsolete systems which are SCADA (Supervisory control and Data Acquisition) Realflex for signals and traction, SCADA maintenance server and Radio systems.

=====TO BE CONTINUED=====