Maximo and Syclo in Northern Ireland Electricity

Mobilising the utility

PCTY2012

Pulse Comes to You

Optimizing the World's Infrastructure
30th May 2012, Grange Tower Bridge, London

Today's Presentation

- Within Northern Ireland Electricity (NIE), Maximo is critical in delivering effective Asset Management for substation plant.
- Building on our existing Syclo solution for substation inspections, we now wish to implement additional functionality around plant maintenance.
- NIE is also recognising further potential in Maximo and mobile deployment for managing other key areas of our business – beyond those originally planned for Maximo.
- We will look at the current Maximo implementation, the 'approved' developments, and some yet to be sanctioned.

Northern Ireland

- Northern Ireland, part of the UK, population of 1.7M people. Capital city is Belfast, with a population of 580,000.

- Traditional industries: agriculture, textiles, shipbuilding and aircraft manufacture.

- Famous for…Bushmills Whiskey, the Titanic, the De Lorean, and golf!

- Modern industries: tourism, IT, aerospace and pharma.

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Northern Ireland Electricity

- NIE is part of the ESB group of companies.
- ESB (Electricity Supply Board) is the semi-state owned generation, transmission and distribution company in the Republic of Ireland.
- ESB turnover was £2.3B in 2010, with an asset base of £10.5B.
- NIE turnover was £151M in 2010, with an asset base of £1B (aiming to double in ten years).
- NIE has sole responsibility for Transmission and Distribution of electricity to 800,000 customers in Northern Ireland.

NIE Structure and Maximo
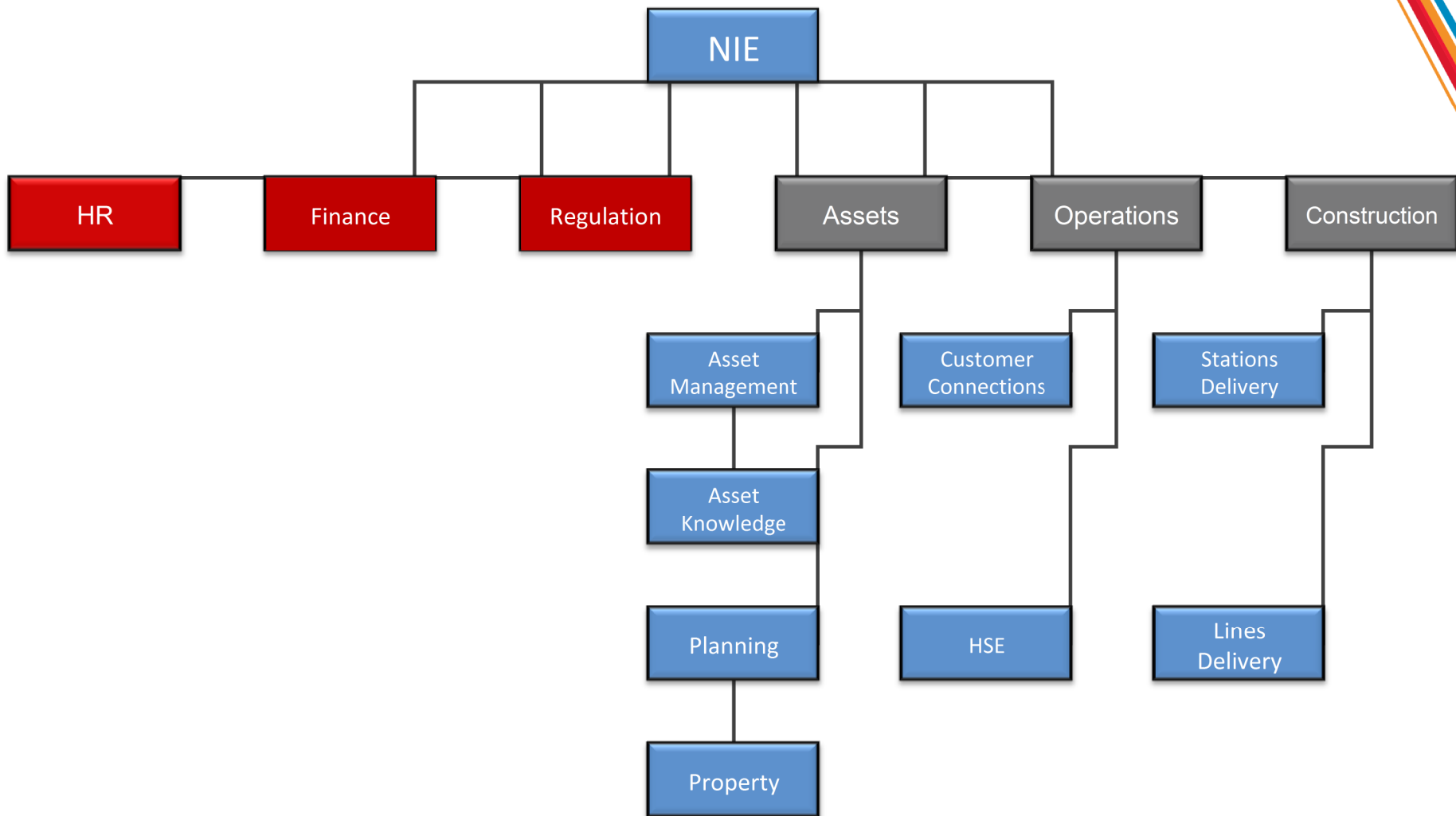
Maximo in NIE

- Substation network:-

    ➢ 9 x 275/110 kV (with 2 new sites planned)

    ➢ 42 x 110/33kV (with 6 new sites planned)

    ➢ 210 x 33/11kV

    ➢ 8,500 Secondary Distribution (Ground Mounted)

    ➢ 75,000 Secondary Distribution (Pole Mounted)

- 200,000 locations, 150,000 assets, 57,000 PM records, circa. 40,000 Work Orders / year.

- 4,500 tools under calibration / test.

Pole-mounted substation
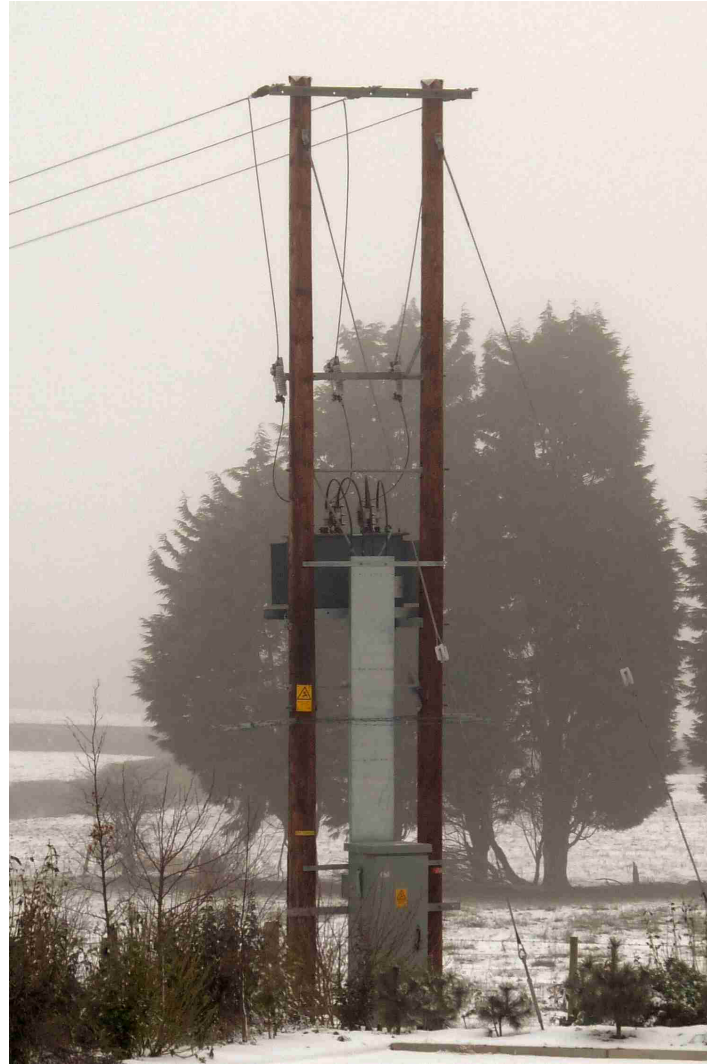
Package substation (indoor)
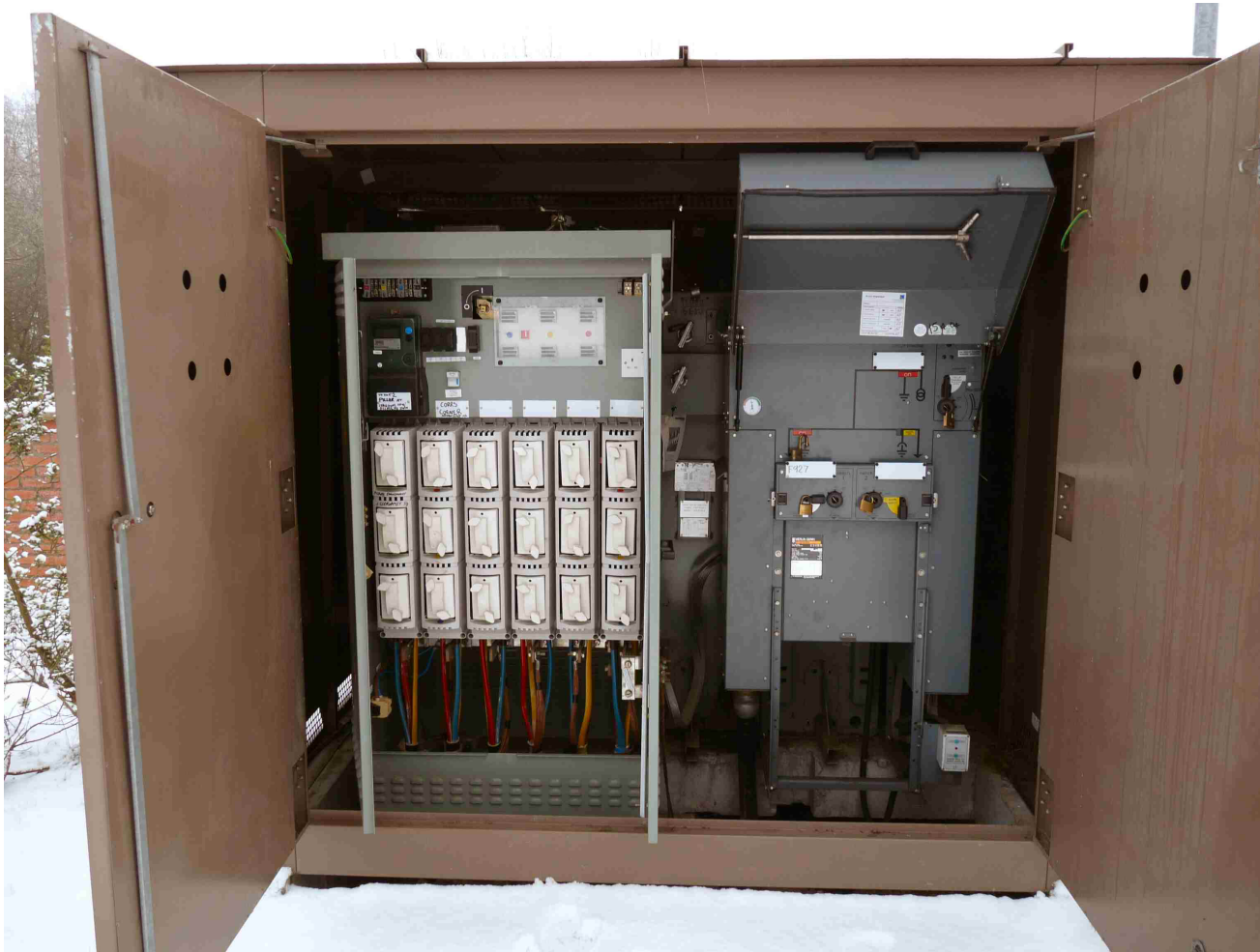
Package substation (outdoor)

Primary substation

Transcription substation

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Sam Gibson

- Asset Knowledge Manager, responsible for all Asset Management support systems (Maximo, Smallworld, Grade One etc.)

- Electrical Engineer / Six Sigma Black Belt.

- Part of the original team delivering Maximo v3.

- Founder committee member Maximo UK & Ireland User Group (Tivoli Premier User Group).

- Member of GTUG Committee.

Maximo history in NIE

- Introduced as v3 in 1997 then v4 for Y2K compliance.

- Transmission data transferred from En Garde in 2002.

- Integrated with Job Management System in 2004.

- Upgraded in 2008 to v6 (now 6.2.8) over Citrix.

- Syclo rolled out in autumn 2011 for substation inspections.

- Protection and Control assets added winter 2011/2012 (with Cal).

- Integrated with SAP-ISU winter 2011/2012.

So what does Maximo do?

- Initially introduced to act as...

  - Plant register.

  - Plant work management system.

- However the world has moved on.

- Maximo now needs to...

  - Support legislation (EAW / WAH / ESQCR).

  - Deliver asset management excellence (supporting PAS 55, CRO, CBM).

  - Integrate. Become a knowledge system…adding value to data.

Maximo development / support

- Maximo (and Syclo) supported under our Managed Service contract with Northgate Information Systems.

- Northgate back-end support with Vetasi.

- NIE development framework (2 years) separately awarded to Vetasi for both Maximo and Syclo.

- System Dynamics also retained on framework.

- All development delivered on Test system(s) by partners.

- Documentation delivered to Northgate.

- Re-applied by Northgate on Test.

- Only then, deployed on Production by Northgate.

Maximo Server Family

	Production	DR	Test	Travellers	Old Test
Database	Tom	Pike	Huey	Del	Great Uncle Bulgaria
Application	Dick	Wilson	Dewey	Rodney	
Reports	Harry	Jones	Louie	Albert	
	Virtual				
Syclo	Burke		Hare		
	DMZ		*NAT bubble*		
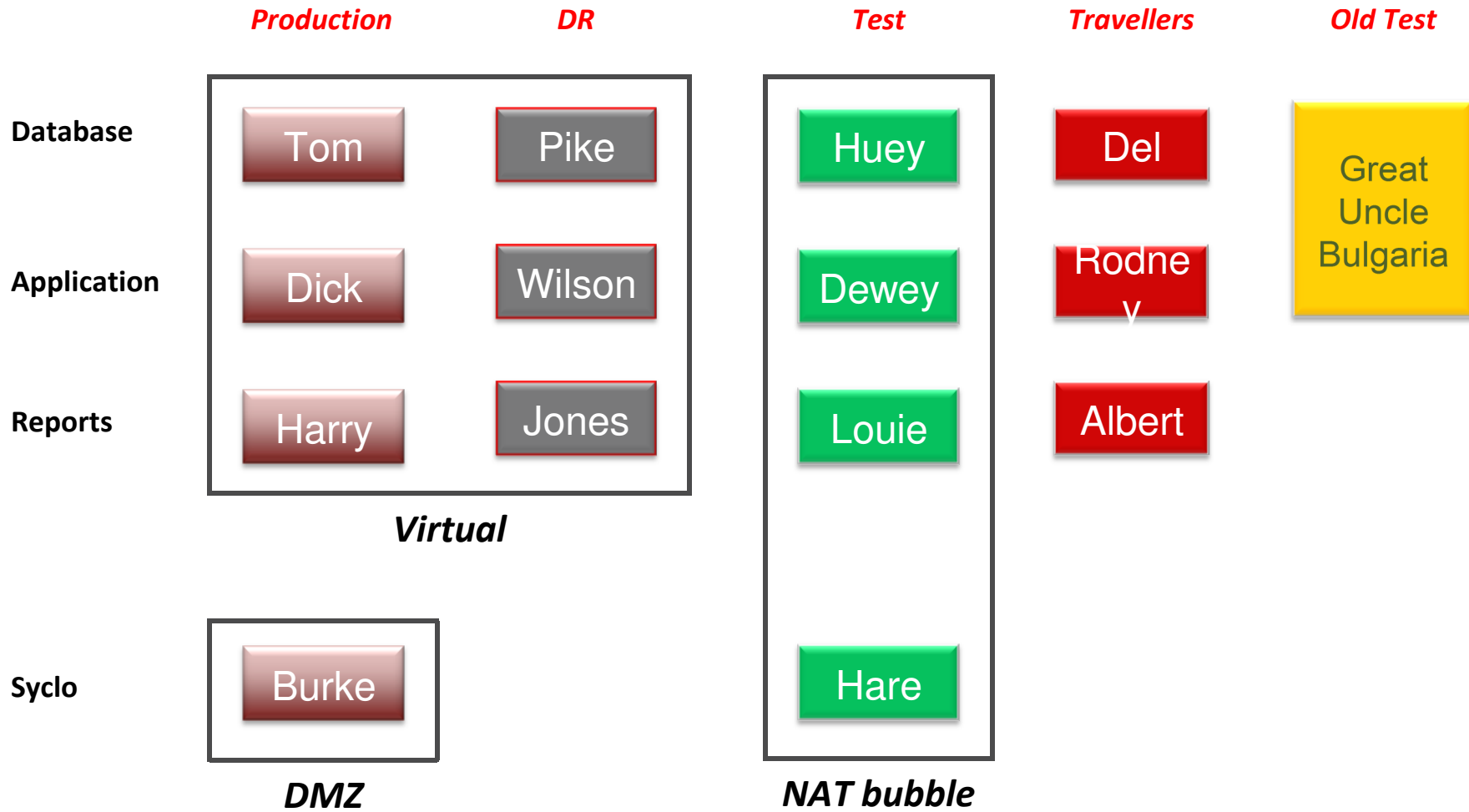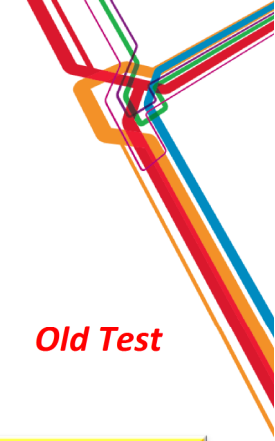
Maximo Mobile Working

- Initially to replace 10,000 paper inspections per year.

- Now, seeking to add some 1,000 maintenance tasks.

- Deployment of 40 devices.

- Digital image collection, for immediate action on defects.

- 3G infrastructure, backed up by docking as required.

- Maps, diagrams, ISO procedures in the field.

- Deployed using Syclo Mobile Work Manager.

- Highly customised, Syclo v4.

Motion F5

- Semi-rugged.

- Excellent handwriting recognition.

- With spare battery, full day working.

- Integrated camera.

- Integrated 3G / GPRS / wi-fi.

- View Anywhere display.

- Windows XP or W7.

- Solid State Drive.

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Phase 1 - delivered

- Substation inspections.

- Acquisition of devices, inclusion into Managed Service.

- Development of solution (customisation of Syclo).

- Testing, training, and pilot scheme.

- Full deployment.

Defect management

- Coded, rather than free text, output from Mobile.

- Defects attached to relevant assets and locations.

- Escalations and Workflow used to route defects to the relevant resource.

- Where defects are not resolved, Maximo provides escalation through the organisation.

- Visibility of defect issues not currently available, and some of these defects will be safety critical.

- Longer term – integrated GIS to allow effective area working.

Defect management

Phase 2

- Upgrade to Syclo v6.

- Implementation of Mobile Device Management, in conjunction with Northgate Service Desk.

- Transfer of circa. 200 work procedures from ISO paper based system to Maximo Job Plans.

- Application of new Job Plans to circa. 10,000 asset PMs.

- Testing, training and pilot scheme.

- Full deployment.

Current checksheet
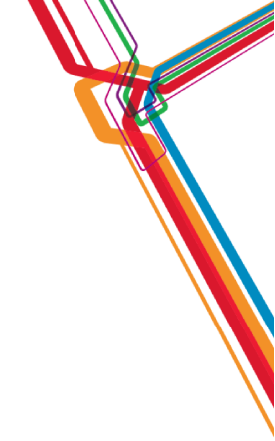
Maintenance Procedure No C05A1   Appendix 1   Issue 1   Page 1 of 1

CHECK SHEET FOR REYROLLE LM23/36T CIRCUIT BREAKER

DISTRICT_____ SUBSTATION_____

SWITCH NO_____

*Delete where applicable   MAIN DOCUMENT

REYROLLE LM23/36T Serial no.		Circuit Breaker Rating	A	Trip Coil Voltage	V
*Initial Electrical Trip	*YES	*NO	*Coil Profile Recorded	*YES	*NO
Ambient Temperature	°C	Equip Serial No		Cyclometer Reading	

				*YES	*NO
Oil changed					
Fibre content check (using polarized lamp)		Equip Serial No		*PASS	*FAIL
Oil moisture content	ppm	Equip Serial No		*PASS	*FAIL
Oil breakdown test	kV(average)	Equip Serial No		*PASS	*FAIL

TICK BOXES AS WORK PROGRESSES

*Delete where applicable

5	GENERAL INSPECTION		12	FIXED CONTACTS	
	Clean out enclosure			Check and dress if wear is not excessive	
	Check shutters and linkage & lubricate pivot points			*Replace contacts if badly worn or damaged	
	Lubricate selector gate mechanism hinges & handles		13	DASHPOT BUFFERS	
	Check panel heater			Check plungers operate freely	
6	EXTERNAL CONDITION OF C/ BREAKER			Remove dashpot and renew buffer rubber washer	
	Clean down circuit breaker			Replace dashpot and check operation	
	Lubricate carriage wheels/ lifting screw / guides		14	GAS VENT	
	Lubricate locating bolt and linkage			Check for obstruction	
	Check interlocks			Check sealing collar moves freely against springs	
7	ISOLATING CONTACTS AND BUSHINGS		15	TANK LININGS BARRIER AND GASKETS	
	Clean and inspect contacts			Clean and inspect tank linings	
	Check security of contacts and grease			Inspect Gasket and renew if required	
	Inspect bushings for damage or scratches			Check tank is clean and fill with clean oil	

Phase 2

- More effective deployment of maintenance teams.

- Direct allocation of work and tracking against labour.

- Capture of condition information from maintenance.

- Capture of defects from maintenance, and routing of same automatically to relevant engineering staff.

- Immediate reconciliation of labour and costs…no more chasing of paperwork.

- Ownership! Changing the culture through effective tools.

Calibration – the Cinderella project!

- 4,500 line MS Excel spreadsheet.

- One clerical resource, trawling spreadsheet each day, updating records, and issuing e-mails.

- Assets transferred to Maximo. Automatic WO generation, notification, and escalation.

- Standardised BIRT management reports, for all senior managers. Positive visibility of Maximo throughout NIE!

Calibration – the Cinderella project!

Calibration – the Cinderella project!

Calibration - Assets Due Within 1 Week Or Less - Message (Plain Text)

File Edit View Insert Format Tools Actions Help

Reply | Reply to All | Forward

From: Maximo Calibration Admin [null]
To: McCartney Sandra; Gibson Sam
Cc:
Subject: Calibration - Assets Due Within 1 Week Or Less

The assets recorded below are due for calibration and have not yet been received at the Plant Workshop. If you have not alr

If you are unable to return this equipment, please download, complete and return one of the three forms below, to myself at
date.

Asset Deletion form : http://www.nie.com/networkservices/pdfs/Asset%20Deletion%20Form.doc
Change of Ownership form : http://www.nie.com/networkservices/pdfs/Change%20of%20Ownership.doc
Location Unknown form : http://www.nie.com/networkservices/pdfs/Asset%20Location%20Unknown%20Form.doc

Regards,
Sandra

Assets due:

Due: 30-MAR-12 - Serial #: 51404268 - Description: M808 MULTIMETER - Owner: SAM GIBSON
Due: 30-MAR-12 - Serial #: 3178598 - Description: PHASE ROTATION TESTER - Owner: SAM GIBSON
Due: 30-MAR-12 - Serial #: UT2/20/29-001346 - Description: ULTRATEV - Owner: SAM GIBSON
Due: 31-MAR-12 - Serial #: 3226605 - Description: 2006S CLAMP METER - Owner: SAM GIBSON

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Statutory Equipment Inspections

Statutory Equipment Inspections

- 3rd party inspector, inspecting circa. 16,000 assets, and using 3rd party database.

- Paper process, with issues around missing / duplicated assets.

- Manual notification of defects to statutory bodies.

- Data to be transferred into Maximo, with automated dispatch to 3rd party inspectors.

- Maximo Mobile / Syclo Work Manager Lite to be used to configure specific screens for I-Pad / Blackberry.

- Immediate notification and automated reporting of high-priority defects.

Property Management

- Regulatory Period 5 (RP5) will see significant Capital Expenditure on the substation population. This will require significant land acquisition / lease / negotiation.

- RP5 programme, and renewable expansion will see significant growth in staff numbers.

- Tririga under consideration for Maximo to provide management tool for both network and corporate properties.

HSE module

- Group Safety require a system for managing incident investigation and resolution, risk assessment, and staff authorisations.

- HSE Module demonstrated, trialled with case studies.

- Co-ordinated with existing Maximo asset base.

- NIE would leverage end-to-end incident managing capability, FMEA tracking, risk matrix, and AOR management.

So what do we need to do?

- Mobile phase 2 – budgeted for 12/13

- Statutory inspections – budgeted for 12/13 (but urgent)
  - Maximo Mobile? (Maximo v7.5)
  - ~~Maximo Everyplace? (Maximo v7.5)~~
  - Syclo Lite? (Maximo v6.2.8, but Syclo v6)

- HSE Module – under consideration only
  - Maximo v7.5

- Maximo Property / Tririga – under consideration only
  - Maximo v7.5

And how do we get there?

- Can Syclo v4 and v6 co-exist on a Maximo v6 platform?

- Can Maximo Mobile co-exist with Syclo v4?

- Do we consider a fresh Maximo v7.5 / Syclo v6 implementation, and gradual transfer?

  - Maximo v6.2.8 for 'original' work, mobile phases 1 and 2, with Syclo v4.

  - Maximo v7.5 for HSE / Property / Statutory Inspections, with Syclo Lite / Maximo Mobile.

  - Move to Maximo v7.5 / Syclo v6 in a controlled manner.

Maximo environment today…

Syclo v4

BIRT

Actuate

Maximo v6.2.8

Cal

Websphere

Oracle 10g

Windows Server 2003

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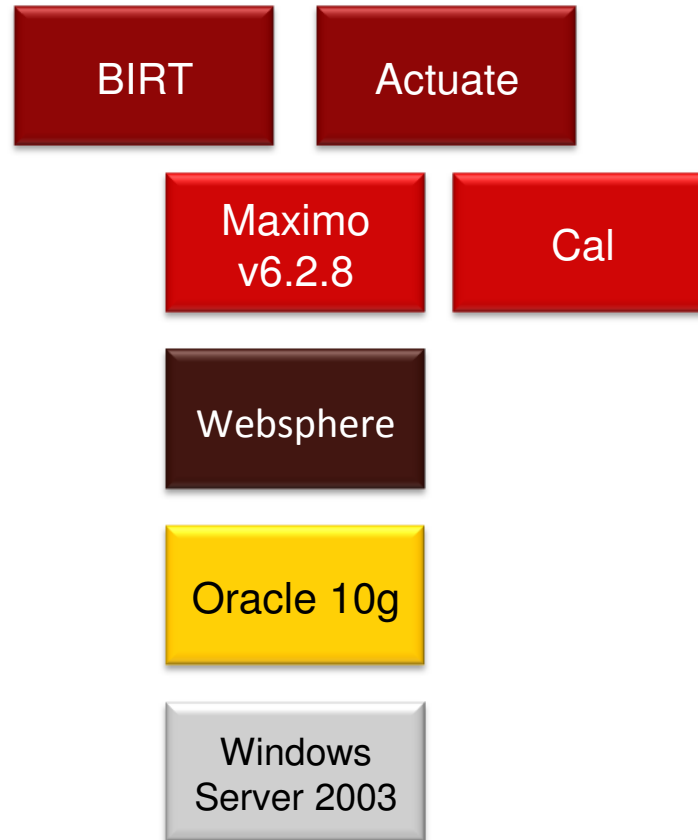
Architecture development

- Policy – latest release where possible, taking 'bleeding edge' into consideration.

- Syclo v6 already identified as beneficial.

- Maximo v7.5 providing baseline for HSE and Property solutions.

- UNIX server identified as performance benefit over Windows platform.

- Both Production and Test to be hosted on virtual machines.

- VPN to be considered for communications.

Maximo environment tomorrow…

VPN — Syclo v6 — Maximo v7.5

- BIRT
- Maximo v7.5 | Cal | Tririga | HSE
- Websphere
- Oracle 11
- UNIX

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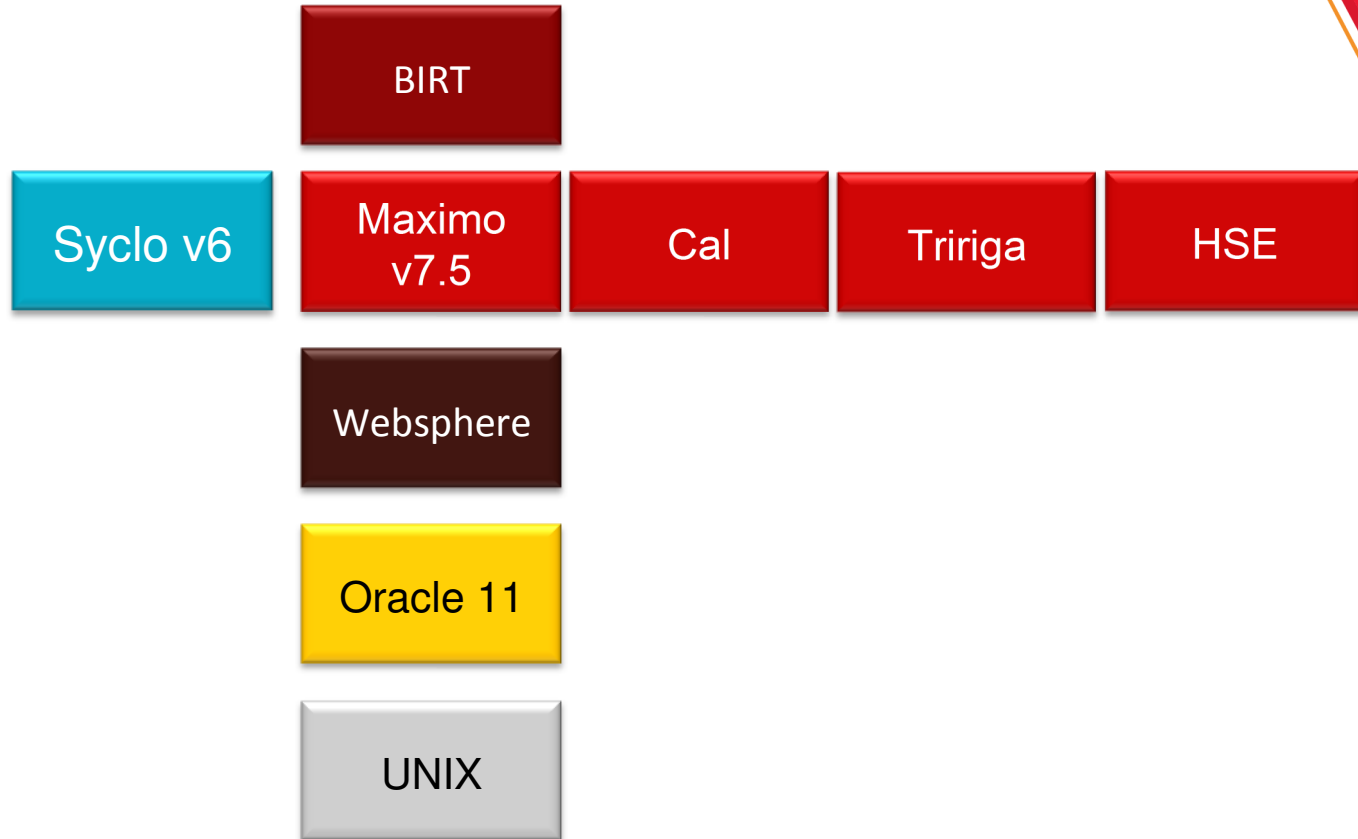
Maximo for overhead lines?
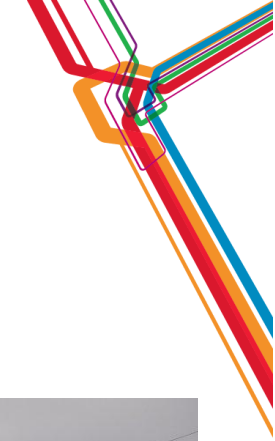
Overhead lines

- NIE currently considering a replacement for Grade One, a bespoke overhead lines asset management application.

- To include vegetation management , undereaves management and helicopter patrolling.

- To support new ESQCR legislation.

- Required to interface with GE Smallworld GIS.

- Field inspections to be delivered remotely.

- 'Scenario modelling' required to cost different levels of refurbishment (Java customisation?)…or bespoke JMS link?

- Circa. 60 users.

Conclusions

- Maximo provides the functionality and flexibility to manage the wide-ranging operations of an electricity utility.

- Syclo provides the functionality and connectivity to effectively mobilise our workforce.

- Mobile working elevates inspection and maintenance tasks to new levels. Data capture, prioritisation, escalation and resolution all gain major improvements.

- Why are we using a mobile solution – to reduce system risk and cost of delivery / defects processes - achieved!

- Maximo demonstrating a true EAM capability.

Thank you for your attention…

Any questions?

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Acknowledgements, disclaimers and trademarks

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