

Overview of Should Cost development: process and outcomes

(Direct Cost Efficiency)

Oct 2012 – March 2013



**UTILITY OF
THE YEAR**

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1. Introduction

UK Power Networks (UKPN)'s vision is to become sustainably cost efficient and achieve upper 3rd performance. Unit costs are an effective and simple management tool and UK Power Networks understand managing unit costs will be integral to achieving the overall goal of upper 3rd performance.

In the next price control period (RIIO-ED1), Ofgem's view of UKPN's efficiency will be based on a range of assessment tools of which unit costs (UCIs) are one. Establishing and tracking unit costs through appropriate targets will be an important part of managing performance against the final settlement during RIIO-ED1.

UK Power Networks has focused on budget costs and unit costs which vary from regulatory RIGs unit costs. This has meant that Regional and Area managers have not always had a clear view as to why costs are greater than industry benchmarks. A separate project has been established to improve reporting to regulatory standards and improving visibility of industry benchmarks.

2. Objectives and Scope

The objective was to develop Should Cost UCIs in order to:

- Baseline current activities to help manage costs
- Understand unit cost variances and key cost drivers across regions
- Provide Regional and Area Managers with granular breakdown of costs
- Understand and address the gap between the Should Cost UCIs, actuals and industry benchmarks

Scope:

The scope of the UCIs covered the main cost categories covered by unit costs where benchmarking data is available. For operating costs these covered Faults (reflecting RIGS table CV15), Inspection and Maintenance (RIGS table CV13) and Tree Cutting (RIGS Table CV14). For Capex the categories covered by RIGS table CV3 were chosen as these have historic benchmark information.

The selected RIGS tables cover 171 activities. Section 5.4.2 describes how these were prioritised.

3. Timescales

The project started late October 2012 and lasted twenty one weeks with three full time resources.

Activity	Date complete
Project kick off	22nd October 2012
Sign off Should Costs	28th March 2013

4. Governance - Steering Group

The project was managed and approved by the Network Operations SMT as part of a wider direct cost efficiency project:

- Patrick Clarke – Director of Network Operations
- Tony Cohen – Head of Network Operations London region
- Pat Brooks – Head of Network Operations Eastern region
- Colin Barden – Head of Network Operations South Eastern region
- Keith Hutton – Head of Strategy & Regulation
- Chris Glover – Head of Commercial Services

5. Process

5.1 UCI definition

UKPN defines a UCI as a unit cost that represents the cost of producing one unit of a good or service. This unit cost can be calculated for an item of equipment or a linear metric. Measuring and managing UCIs on a consistent basis with RIGS reporting provides an important benchmarking tool using the data shared with the industry by Ofgem. Using UCIs at this level will also help internally to understand and justify our costs on a regulatory basis and identify and plan efficiency improvements for activities where UKPN are higher than industry costs.

5.2 Should Costs definition

Currently UKPN track cost performance on unit costs across different NAMP (network asset management plan) lines which are at a more detailed task based level than RIGs unit costs. In order to create meaningful Should Costs that the business would understand, Should Costs were developed at the NAMP level. These Should Costs were then rolled up to RIGs level using the same approved mapping currently used to roll current NAMP performance to RIGs. This process has enabled bundled Should Costs to be benchmarked with the RIGs level targets.

The Should Costs reflect how UKPN should be performing if processes were optimal, providing a baseline view of “good” performance. They are the average costs of delivering a standard job. They make no allowance for any unproductive time. Developing ‘Should Costs’ UCIs will identify areas where more cost is being incurred or recorded and also where achievement may not be recorded correctly.

5.3 Targets

OPEX target: For DPCR5 no target unit costs for OPEX were published (Faults, Trees & Inspection & Maintenance). Therefore UKPN developed target unit costs based on the industry median of the 14 DNOs. For the purpose of targets for this project the 11/12 industry median minus 10% was used for all opex lines. Many opex costs exhibit a large range of values between DNOs, so industry median was selected rather than using the average. For Tree Cutting targets based on total cost divided by spans inspected was developed to align with managed service contracts in place in UK Power Networks.

Capex target: These were based on Ofgem’s unit costs from the DPCR5 Final Proposals.

5.4 Overall Process

The project team developed a structured process starting with UCI data gathering from across the business, e.g. Finance, Strategy and Regulation etc. through to developing and rolling out Should Costs



5.4.1 Check data availability and gather data

Before the development of Should Costs started, all the UCI data available in the business was collated. This helped us understand:

- UKPN’s current UCI performance and existing targets (e.g. budget UCIs)
- The industry’s UCI performance
- UKPN’s relative position compared to its peers

The table below provides a summary of the main data points used in the analysis.

	Description	Granularity
Current UCI UKPN performance	YTD Performance	RIGs, NAMP, Area, LMCGO
Industry UCI performance	Performance by DNO	RIGs, DNO
	Industry median	RIGs, DNO
UKPN UCI Targets	Internal budget targets set by Finance	NAMP, DNO
	Industry median target set by Strategy & Regulation (based on UCI median of all DNOs)	RIGs, DNO

5.4.2 Prioritise focus UCIs for Should Cost creation

The RIGs tables selected contain 171 reportable lines for which UCIs could be developed. However only a small number of reporting lines cover the majority of the expenditure reported in these tables. In order to maintain focus and optimise team effort, RIGs lines were prioritised based on percentage of expenditure reported. For tree cutting 'Should Costs' were considered on a total cost per span managed/inspected in line with current UKPN contracts. For Capex focus was applied to 85% of distribution capex where year on year cost should be repeatable and project specific factors present in major construction projects have less impact.

Internally reported CV table	Description	Percentage of spend Should Costs cover of reported RIGs	Number of RIGs reporting lines
CV3	Capex	> 85%	6 EPN 7 SPN 8 LPN
CV13	Inspection and maintenance	> 85%	20 EPN/SPN 18 LPN
CV14	Trees	100%	4 EPN/SPN
CV15	Faults	> 90%	7 EPN/SPN 4 LPN

5.4.3 Analyse current UCIs

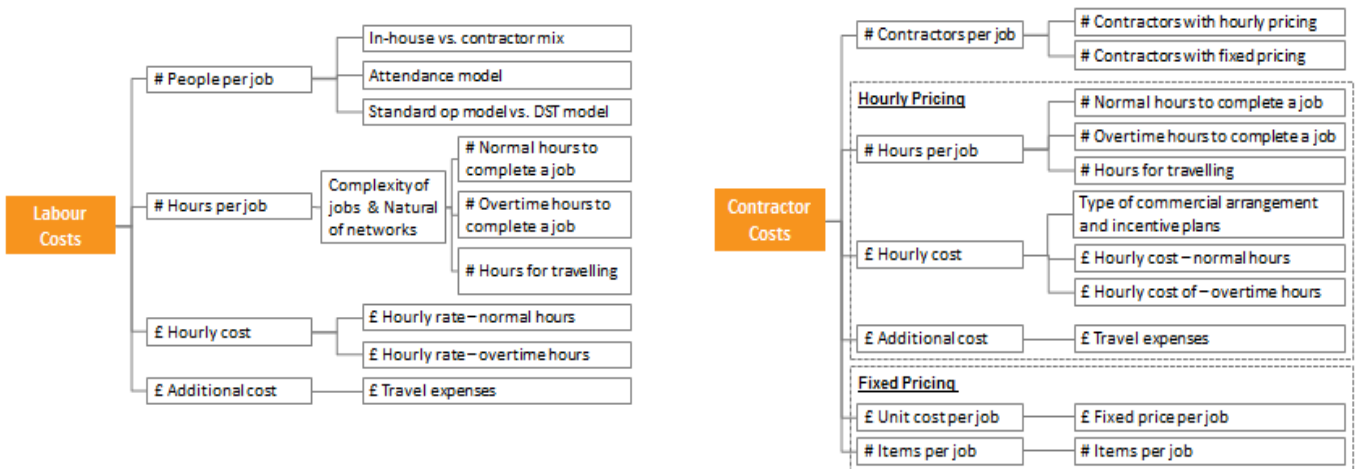
The table below summarises the analysis undertaken by the project.

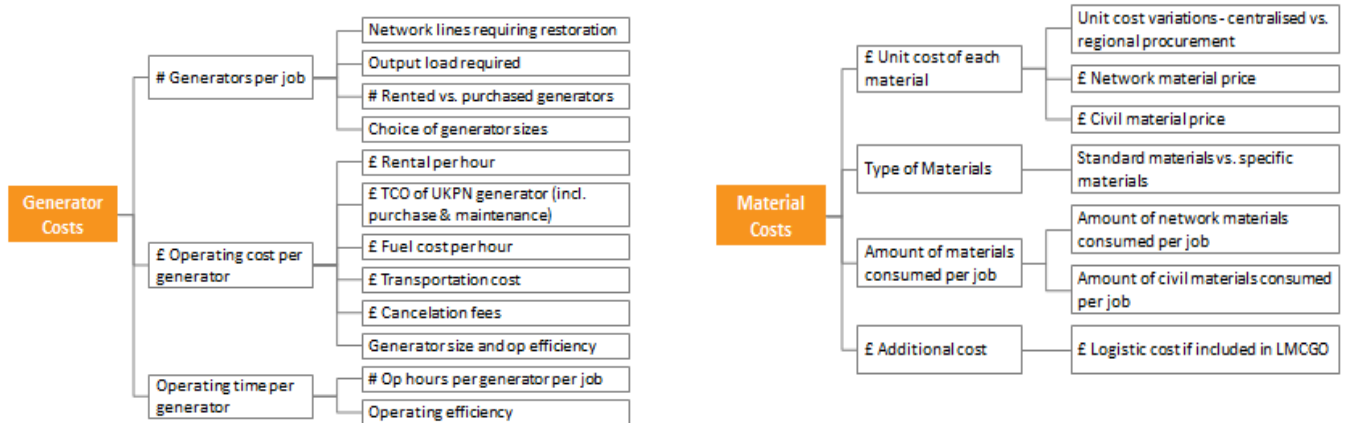
Analysis	Description	Granularity	Data sources
Current performance (across UKPN DNOs)	Comparison of YTD performance across DNOs	<ul style="list-style-type: none"> DNO LMCGO NAMP 	<ul style="list-style-type: none"> Finance (September report)
Current performance (within UKPN DNOs)	Comparison of YTD performance across areas within each DNO	<ul style="list-style-type: none"> Area LMCGO NAMP 	<ul style="list-style-type: none"> Finance (September report)
Regulatory target versus financial budget	Comparison of RIGs targets and budget by DNO (LBE) NAMPs aggregated at RIGs level to allow comparison	<ul style="list-style-type: none"> DNO RIGs 	<ul style="list-style-type: none"> Budget: Finance Target: Regulation
Performance versus financial budget	Comparison of YTD performance against budget by DNO	<ul style="list-style-type: none"> DNO Total UCI NAMP 	<ul style="list-style-type: none"> Finance
Performance versus regulatory target	Comparison of YTD performance against targets by DNO	<ul style="list-style-type: none"> DNO Total UCI RIGs 	<ul style="list-style-type: none"> Regulation

LMCGO: Labour, Materials, Contractors, Generation, Other. Temporary generation costs have been identified as an area of specific focus.

5.4.4 Develop cost hypothesis diagrams

In order to understand the key cost drivers for each UCI cost component (Labour, Contractor, Generators, and Material), hypothesis trees were developed. These were used to ensure exhaustive Should Cost models were created and suitable challenge was provided to the business.





5.4.5 Develop bottom up Should Costs

For each CV table, a series of workshops were held to develop the relevant Should Costs. These included a range of operational business representatives from each region to ensure Should Costs were credible and based on empirical experience.

Key Stakeholders

Title	Area	Engagement	
Facilitator – Project resource	N/A	All	
Business analyst – Project resource			
Finance			
Asset Management			
Contract Management			
Area Manager	EPN	Faults	
Area Manager	EPN		
Faults Manager	LPN		
Lead Field Engineer	SPN		
Logistics Manager	N/A	Inspection and maintenance	
Technical & Service Dev Manager	N/A		
Maintenance Manager	EPN		
Network Operations Manager	SPN		
Lead Engineer	SPN		
Maintenance Manager	LPN		
EHV Manager	LPN	Capex	
Distribution programme Manager	EPN		
Senior Project Manager	SPN		
Programme Delivery Manager	LPN		
Project Manager	LPN		
Project Manager	LPN		
Tree Contract Manager	EPN		Trees
Tree Manager	EPN		
Area Tree Manager	SPN		
Asset Management	All		

Example model dashboard

Region	RIGs	Activity	Voltage	NAMP	NAMP Description	%	Should Cost UCI NAMP level	UCI Should cost RIG level	Target Industry Median -10%	Variance Should cost to 13/14 RIG Target
EPN	CV15 38	Supply Restoration by Switching Only (Non Damage Fau	LV Network	Total		Total		198	203	-2%
EPN	CV15 38	Supply Restoration by Switching Only (Non Damage Fau	LV Network	2.01.28	Blown LV Fuses at Sub	100%	198			
EPN	CV15 46	Overhead	LV Services (excluding cut out incidents)	Total		Total		449	491	-9%
EPN	CV15 46	Overhead	LV Services (excluding cut out incidents)	2.01.10	service fault repairs o	100%	449			
EPN	CV15 47	Underground	LV Services (excluding cut out incidents)	Total		Total		1,452	1,147	27%
EPN	CV15 47	Underground	LV Services (excluding cut out incidents)	2.01.07	service fault repairs ur	100%	1,574			
EPN	CV15 47	Underground	LV Services (excluding cut out incidents)	3.01.15	services - LV Cable Dar	100%	837			
EPN	CV15 49	UG Cables (Non CONSAC) - Asset Repair/Replacement R	LV Network	Total		Total		2,157	2,681	-20%
EPN	CV15 49	UG Cables (Non CONSAC) - Asset Repair/Replacement R	LV Network	2.01.27	LV cable fault repairs	100%	2,475			
EPN	CV15 49	UG Cables (Non CONSAC) - Asset Repair/Replacement R	LV Network	3.01.01	LV Cable Damage	100%	1,511			
EPN	CV15 52	LV Network	All Other Switchgear, Plant & Equipment - A	Total		Total		565	458	23%
EPN	CV15 52	LV Network	All Other Switchgear, Plant & Equipment - A	2.01.19	other plant (LV etc)	100%	565			
EPN	CV15 54	UG Cables - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	Total		Total		4,959	4,524	10%
EPN	CV15 54	UG Cables - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	2.01.24	11kV cable fault repair	100%	5,660			
EPN	CV15 54	UG Cables - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	3.01.11	11kV Cable Damage	100%	4,210			
EPN	CV15 55	OH Lines - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	Total		Total		1,848	2,243	-18%
EPN	CV15 55	OH Lines - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	2.01.03	4T - HV OHL fault repa	100%	1,851			
EPN	CV15 55	OH Lines - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	3.01.10	11kV Overhead Damag	100%	1,806			
EPN	CV15 55	OH Lines - Asset Repair/Replacement Required	HV Network (11 kV & 20 kV)	2.01.45	Major Fault contingend	100%	0			
LPN	CV15 38	Supply Restoration by Switching Only (Non Damage Fau	LV Network	Total		Total		196	203	-3%
LPN	CV15 38	Supply Restoration by Switching Only (Non Damage Fau	LV Network	2.01.28	Blown LV Fuses at Sub	100%	196			
LPN	CV15 47	Underground	LV Services (excluding cut out incidents)	Total		Total		2,570	1,147	124%
LPN	CV15 47	Underground	LV Services (excluding cut out incidents)	2.01.07	service fault repairs ur	100%	2,690			
LPN	CV15 47	Underground	LV Services (excluding cut out incidents)	3.01.15	services - LV Cable Dar	100%	1,961			
LPN	CV15 49	UG Cables (Non CONSAC) - Asset Repair/Replacement R	LV Network	Total		Total		3,238	2,681	21%
LPN	CV15 49	UG Cables (Non CONSAC) - Asset Repair/Replacement R	LV Network	2.01.27	LV cable fault repairs	100%	3,687			

Following the workshops, completed Should Cost models were sent out to the business, Friday 8th March, for final review, comments and sign off.

5.4.6 Identify savings opportunities/constraints

Throughout the workshops and subsequent review sessions with the business, opportunities and constraints to achieving the industry targets were captured (RIGs and NAMP level). Opportunities focused on the following:

- Achieving Should Costs.** For example:
 - Improve data accuracy (e.g. achievement recording, cost allocation, capitalisation)
 - Improve productivity
 - Improve management of contractor charges
 - Improve material costs through reviewing specifications / supplier contracts
 - Improve use of generators
- Delivering the industry median target:** through creating plans to improve upon current operations and Should Costs, for example:
 - Different resourcing model
 - Lower contractor rates
 - Optimal in house vs. outsourcing mix

These opportunities are particularly important where Should Costs are higher than the industry median. Where 'Should Costs' developed are significantly below observed industry costs, further consideration of scope of work should be given in subsequent reviews.

5.4.7 Develop roll out plan and strategy

These opportunities were cascaded on to Area and Regional Managers for review, and as input for their area level plans. They are accountable for:

- Delivering UCI performance against the UKPN target

- Comparing poor current NAMP performance with Should Costs to identify improvement opportunities
- Developing with Finance, roll out plans and strategies, at area level, to achieve targets

6. Results

6.1 Key Findings

- Contractor and Labour costs make up the bulk of unit costs
- There are significant cost variances between LPN, EPN and SPN regions due to a range of factors. E.g.:
 - LPN labour costs are higher than EPN and SPN
 - On average, contractor rates in London are more expensive
 - Contracts and contractual arrangements vary across regions
 - Different blend of in house and contractor work e.g. groundworks activities are done internally in SPN, and through contractors for the other regions
 - Different resourcing models across the regions (different types of resources sent to jobs)
 - Lane rental, street works and permitting costs are more expensive in London
 - Work tends to be technically more complex in London; more confined spaces, ground conditions require more excavation, larger sites and transformers, blend of 4 way to 2 way link boxes etc.
 - Different blend of owned and hired generators e.g. SPN do not currently own any generators
 - Different materials are used in some cases due to network conditions
- For Trees, there are significant cost variance between SPN and the EPN regions due to:
 - The varying states of the network. SPN has greater 132kV network infestation than EPN North
 - EPN South having a reactive contract following withdrawal of previous contractor.

6.2 Key Opportunities

The below table summarises possible key opportunities to improve unit cost performance. It is not an exhaustive list and all opportunities require full investigation before they are applied to the business.

Key Opportunities	Description	Scope
Provide guidance to manage costs and volumes reporting	<ul style="list-style-type: none"> • Communicate basic and consistent ground rules around cost allocation <ul style="list-style-type: none"> - Briefings and training for existing staff - Creation of materials for future new joiners 	<ul style="list-style-type: none"> • Faults • I&M • Capex • Trees
	<ul style="list-style-type: none"> • Allocate item of plants in substation to appropriate service orders • Follow up with strategy and regulation for a consistent approach to booking consequential assets to jobs 	<ul style="list-style-type: none"> • Capex
	<ul style="list-style-type: none"> • Book costs (eg tree planting, compensation, and permission forms) to correct outage planning line. Currently SPN have a NAMP to book to whereas EPN do not. Ensure a consistent approach 	<ul style="list-style-type: none"> • Trees
Improve achievement recording	<ul style="list-style-type: none"> • Ensure all volumes are recorded in the systems • Ensure process's enable activities to have achievement appropriately captured in preferred system 	<ul style="list-style-type: none"> • Faults • I&M • Capex • Trees
	<ul style="list-style-type: none"> • Investigate how to best record customer driven achievement 	<ul style="list-style-type: none"> • Trees
Reduce labour costs	<ul style="list-style-type: none"> • Improve dispatch tasking to ensure efficient number of staff on jobs • Ensure staff have a full day's work (improved productivity) • Ensure non-productive time is booked correctly and is visible. • Plan to ensure the job goes ahead. If it doesn't the costs should go to unproductive time to improve visibility of productivity • Extend shift working in SPN (currently 4pm; proposal 12am) 	<ul style="list-style-type: none"> • Faults • I&M • Capex

Key Opportunities	Description	Scope
	<ul style="list-style-type: none"> Optimise UKPN policies to avoid unnecessary work Standardise scope across regions 	
	<ul style="list-style-type: none"> Introduce faults technicians in LPN to provide increased supervision, coaching and improved productivity to faults jointers 	<ul style="list-style-type: none"> Faults
Reduce contractor costs	<ul style="list-style-type: none"> Review strategy for groundworks in EPN and LPN Assess resourcing strategy enable us to bring work in house in medium/long term Improve management and itemisation of extras in contracts (Contract Management and local areas) Improve audit activities on bill of quantities per job Ensure invoices and price estimates for work can be matched to contractor rates (Contract Management activity) 	<ul style="list-style-type: none"> Faults I&M Capex
	<ul style="list-style-type: none"> Reduce contractor costs to 20 teams (40 staff) in EPN by bringing the work in house Insource reactive tree cutting in EPN 	<ul style="list-style-type: none"> Faults
	<ul style="list-style-type: none"> Insource reactive tree cutting in EPN Align contractor schedule of rates to RIGs reporting (inspection and Cut) 	<ul style="list-style-type: none"> Trees
	<ul style="list-style-type: none"> Review and optimise own staff and contractor resourcing in LPN 	<ul style="list-style-type: none"> Capex
Reduce material costs	<ul style="list-style-type: none"> Review and allocate materials and consumables booked to jobs correctly Review material specifications 	<ul style="list-style-type: none"> Faults I&M Capex
Reduce generator costs	<ul style="list-style-type: none"> Improve utilisation of owned generators Purchase generators to reduce reliance on contractors New generator tender for EPN (Contract Management activity) 	<ul style="list-style-type: none"> Faults I&M Capex

7. Challenges

Challenges	Proposed solution
The quality of current performance data is poor in some cases limiting the Area and Regional Managers ability to understand and address the operational performance gap.	In parallel, a UCI data quality project has been on-going with the sole objective of rectifying this issue. However, the Should Costs will additionally help by identifying significant performance gaps and highlighting areas for targeted investigation.
Throughout the workshops it became clear that not all regions were following a consistent approach to booking costs and recording achievement. This made it difficult to develop consistent Should Cost models.	We are rolling out cost, volumes and UCIs Guideline packs to the business to improve consistency and accuracy for all regions.
Should Cost models could not always be consistent across the regions due to several factors: e.g. varying resourcing models, contractors, environments etc.	Documented reasons for variances within the Should Cost models.

8. Conclusions

The tables in the Appendix 1 detail the outcomes for the UCIs considered against final benchmark costs and with the UCI selected for the RIIO-ED1 period. The benchmarks were based on industry median costs derived from the 11/12

data shared with the industry, making allowing for regional costs. For Inspections and Maintenance, the use of median cost on an activity basis indicated an overall position that was unrealistic, so the benchmarks were adjusted to reflect an industry upper quartile view. These were compared with the output from the Should Cost models and a suitable target selected.

To ensure cost targets are achieved and Should Costs refined the following actions will be implemented.

On-going management of Should Cost models:

- Finance will be custodians for the models which are now available to the business on an intranet page.
- The Should Costs are living documents that will continually be managed to be kept relevant and up to date as LMGCO costs change.
- A formal process has been designed and put in place to ensure that these Should Costs are reviewed at least every six to twelve months. They will be regularly tested and validated against latest current performance and budget.

Delivering on the UCI targets:

- UCI targets cascaded down to Area Managers and embedded in their performance targets.
- Finance will coordinate a monthly process with Area Managers to drive the correct focus on UCIs through the business
 - Make unit cost performance gaps visible to Area Managers and Field Staff Supervisors through monthly reports produced showing actual performance against targets and Should Costs
 - Hold monthly meetings to undertake a detailed UCI review including:
 - Jobs with no achievement but with costs
 - Jobs with costs but with no achievements
 - UCIs that are higher than should be costs
 - Analysing the highest UCIs to ensure mis-postings are corrected and an understanding of variations is agreed.
 - Area P&L
 - Develop and review strategies and initiatives to reduce the UCIs
- Clear cost and volume guidelines rolled-out to all staff to improve cost allocation and data quality

9. Appendix 1 (all 11/12 prices)

Faults EPN

RIGs	Description	Benchmark 11/12 Industry Median -10%	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Examples of possible solutions to meet targets	Input for ED1
CV15 47	Underground asset repair LV Services	1,147	1,452	1,147	No	<ul style="list-style-type: none"> Review groundworks strategy (decision in Q3, implementation Q1/Q2 2014) Ensure the right contractor rates are applied (service vs. mains faults) 	11/12 Median-10%
CV15 38	Supply Restoration by Switching Only LV	203	198	203	Yes	<ul style="list-style-type: none"> Reduce generator costs Insource work done by contractors (recruitment and training of internal staff) 	11/12 Median-10%
CV15 46	Overhead LV Service	491	449	491	Yes	<ul style="list-style-type: none"> Insource done by contractors (recruitment and training of internal staff) 	11/12 Median-10%
CV15 49	UG Cables (Non CONSAC) LV	2,681	2,157	2,157	Yes	<ul style="list-style-type: none"> Reduce contractor spend Reduce repeat visits and labour costs Reduce use of generators 	DCE Should Costs
CV15 52	All Other switchgear, plant & equipment asset repair LV	458	565	565	Yes		DCE Should Costs
CV15 54	UG Cables – asset repair HV	4,524	4,959	4,524	Yes	<ul style="list-style-type: none"> Improve location process Reduce material costs Dedicated test van drivers 	11/12 Median-10%
CV15 55	OH Lines – asset repair HV	2,243	1,848	1,848	Yes	<ul style="list-style-type: none"> Reduce repeat visits and labour costs Reduce use of generators 	DCE Should Costs

Faults SPN

RIGs	Description	Benchmark 11/12 Industry Median	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV15 47	Underground asset repair LV Service	1,274	932	1,274	Yes	<ul style="list-style-type: none"> Insourcing of groundworks activities Reduce generator costs (purchase) 	11/12 Median
CV15 38	Supply Restoration by Switching Only LV	225	198	225	Yes	<ul style="list-style-type: none"> More rapids will be used (cheaper than field engineers) 	11/12 Median

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RIGs	Description	Benchmark 11/12 Industry Median	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV15 46	Overhead LV Service	546	428	546	Yes	<ul style="list-style-type: none"> Improve cost allocation and reporting (Q2 2013) Convert 2 linesmen team into 1 linesman + 1 mate (Q1 2014) 	11/12 Median
CV15 49	UG Cables (Non CONSAC) LV	2,979	2,268	2,268	Yes	<ul style="list-style-type: none"> Insourcing of groundworks activities Reduce generator costs (purchasing of generators) 	DCE Should Costs
CV15 52	All Other switchgear, plant & equipment asset repair LV	508	565	565	Yes	<ul style="list-style-type: none"> Industry median target has been met, but further investigation is required to ensure data is correct 	DCE Should Costs
CV15 54	UG Cables – asset repair HV	5,027	5,129	5,027	Yes	<ul style="list-style-type: none"> Insourcing of groundworks activities Reduce generator costs (purchasing of generators) 	11/12 Median
CV15 55	OH Lines – asset repair HV	2,492	1,848	1,848	Yes	<ul style="list-style-type: none"> Industry median target has been met, but further investigation is required to ensure data is correct 	DCE Should Costs

Faults LPN

RIGs	Description	Benchmark 11/12 Industry Median	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV15 38	Supply Restoration by Switching Only LV	225	196	254	Yes		Keith's Numbers
CV15 49	UG Cables (Non CONSAC) LV	2,979	3,238	3,238	No	<ul style="list-style-type: none"> Develop plan for legacy faults (costs but no achievement) Review groundworks strategy 	DCE Should Costs
CV15 47	Underground asset repair LV Service	1,274	2,570	2,058	No	<ul style="list-style-type: none"> Train DST shift jointers to tow and connect generators as part of job – 3 day course 	Actual less 10%
CV15 54	UG Cables – asset repair HV	5,027	6,173	6,173	No	<ul style="list-style-type: none"> Improve data quality 	DCE Should Costs

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I&M EPN

RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 6	OH Pole Line inspection LV	18	11	12	Yes		Median-17.5%
CV13 8	OH Pole Line Shrouding LV	249	445	165	No	Reduce scaffolding costs Reduce labour costs by visiting once not twice	Median-17.5%
CV13 9	LV UGB & LV Pillars (OD Street Located) Inspections	51	30	34	Yes		Median-17.5%
CV13 18	OH Pole Line inspection HV foot	17	12	11	Yes		Median-17.5%
CV13 19	OH Pole Line Repair and maintenance HV	73	149	48	NO		Median-17.5%
CV13 22	Substations - GM Indoor & Outdoor inspection HV	32	15	21	Yes		Median-17.5%
CV13 24	Substations - GM Indoor & Outdoor repair HV	114	234	76	Yes	Should Cost of repairs excluding vegetation clearance volumes	Median-17.5%
CV13 29	GM Switchgear (Exc CBs and X Type RMU) repair	756	1,169	500	No	<ul style="list-style-type: none"> Reduce contractor costs. Backlog of work to be finished this year, on-going contractors costs should be lower 	Median-17.5%
CV13 30	Protection Schemes HV	249	445	445	No	<ul style="list-style-type: none"> Issue recording achievement in Ellipse to be solved 	DCE Should Costs
CV13 31	GM Transformers HV repair	261	70	173	Yes	<ul style="list-style-type: none"> Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken Low should cost driven by assumed proportion of voltage investigations 	Median-17.5%
CV13 42	Underground Cable 33Kv	942	962	623	No		Median-17.5%

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RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
Cv13 43	Substation 33KV Inspections	222	121	147	Yes		Median-17.5%
CV13 44	Substation 33KV repair	1,095	242	725	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	Median-17.5%
CV13 46	Protection Schemes 33KV	380	206	252	Yes		Median-17.5%
CV13 47	Transformers 33KV	672	602	445	Yes	• Reduce scaffolding costs • Contractor costs to be reduced this year • Improve capitalisation of repair oil and gas leaks	Median-17.5%
CV13 70	Underground Cable 132KV	877	5,266	581	No	• Should costs include fault repair cost	Median-17.5%
CV13 71	Substation 132KV Inspections	420	121	278	Yes		Median-17.5%
CV13 72	Substation 132KV Repair	2,889	408	1,912	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	Median-17.5%
CV13 73	Switchgear All Types 132KV repair	1,084	715	718	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	Median-17.5%
CV13 75	Transformers 132KV repair	953	564	631	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken eg oil samples v tap changer maintenance or repairs	Median-17.5%

I&M SPN

RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 6	OH Pole Line inspection LV	19	11	12	Yes		Median-15%
CV13 8	OH Pole Line Shrouding LV	266	445	170	No	• Opportunity to schedule more efficiently (ensure manage customer waiting time still)	Median-15%

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 9	LV UGB & LV Pillars (OD Street Located) Inspections	55	39	35	Yes		Median-15%
CV13 18	OH Pole Line inspection HV Inspections	18	14	11	Yes		Median-15%
CV13 19	OH Pole Line Repair and maintenance HV	78	42	50	Yes		Median-15%
CV13 22	Substations - GM Indoor & Outdoor inspection HV	34	17	22	Yes		Median-15%
CV13 24	Substations - GM Indoor & Outdoor repair HV	122	253	78	Yes	Should cost excluding vegetation clearance	Median-15%
CV13 29	GM Switchgear (Exc CBs and X Type RMU) repair	808	660	515	Yes		Median-15%
CV13 30	Protection Schemes HV repair	266	436	436	No	<ul style="list-style-type: none"> Improve productivity with dedicated protection maintenance Schedule more efficiently 	DCE Should Costs
CV13 31	GM Transformers HV repair	280	214	178	Yes	<ul style="list-style-type: none"> Improve productivity of Voltage investigations 	Median-15%
CV13 42	Underground Cable 33Kv	1,008	2,887	643	No		Median-15%
Cv13 43	Substation 33KV Inspections	237	171	151	Yes	<ul style="list-style-type: none"> Low UCI due to site security inspections volume Review Should Cost scope against actual work undertaken 	Median-15%
CV13 44	Substation 33KV repair	1,172	391	747	Yes	<ul style="list-style-type: none"> Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken 	Median-15%
CV13 46	Protection Schemes 33KV	407	180	259	Yes	<ul style="list-style-type: none"> Should costs include high volume of SCADA maintenance Review Should Cost scope against actual work undertaken 	Median-15%
CV13 47	Transformers 33KV	719	676	459	No		Median-15%

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 70	Underground Cable 132KV	939	9,247	599	No	• Should costs include fault repair cost	Median-15%
CV13 71	Substation 132KV Inspections	449	46	286	Yes		Median-15%
CV13 72	Substation 132KV Repairs	3,090	433	1,970	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	Median-15%
CV13 73	Switchgear All Types 132KV repair	1,160	611	740	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	Median-15%
CV13 75	Transformers 132KV repair	1,019	876	650	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken eg oil samples v tap changer maintenance or repairs	Median-15%

I&M LPN

RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 9	LV UGB & LV Pillars (OD Street Located) Inspections	61	63	50	No	• Change UKPN policy: claim link box and inspection every time operation carried out – reduce revisits • Also a possibility for secondary substations manual switching, security and condition checks	11/12 Median +Regional Costs
CV13 22	Substations - GM Indoor & Outdoor inspection HV	38	38	32	No	• Scope of work in London is greater. • Change UKPN policy: Cleaning too much • Change UKPN policy: Claim to SCS where contractor rate risen due to number of remote controls not working	11/12 Median +Regional Costs
CV13 24	Substations - GM Indoor & Outdoor repair HV	136	212	113	No	• Should cost without vegetation clearance • London factor due to highly loaded substations and ventilation and confined spaces	11/12 Median +Regional Costs

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 29	GM Switchgear (Exc CBs and X Type RMU)	900	450	450	Yes		DCE Should Costs
CV13 30	Protection Schemes HV repair	297	1,190	1190	No	<ul style="list-style-type: none"> LPN more: circuit faults not managed by BT Higher number of unit protected schemes on 11kV network compared to other DNOs – this requires additional resource and time e.g. site liaison 	DCE Should costs
CV13 31	GM Transformers HV repair	311	135	135	Yes		DCE Should Costs
CV13 42	Underground Cable 33kV repair	1,123	4,661	929	No	<ul style="list-style-type: none"> London more expensive, ground conditions deeper and larger excavations, need more excavations 	11/12 Median +Regional Costs
Cv13 43	Substation 33KV Inspections	264	276	218	No	<ul style="list-style-type: none"> London have larger sites (more plant and equipment) and confined spaces 	11/12 Median +Regional Costs
CV13 44	Substation 33KV Repair	1,305	537	1080	Yes	<ul style="list-style-type: none"> Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken 	11/12 Median +Regional Costs
CV13 46	Protection Schemes 33KV	453	971	375	No		11/12 Median +Regional Costs
CV13 47	Transformers 33KV Repair	801	367	663	Yes	<ul style="list-style-type: none"> Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken 	11/12 Median +Regional Costs
CV13 56	Underground Cable, 66 kV	1,121	4,812	928	No	<ul style="list-style-type: none"> Should costs include high fault repair cost 	11/12 Median +Regional Costs
CV13 61	Transformers, 66 kV repair	1,205	418	997	Yes	<ul style="list-style-type: none"> Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken 	11/12 Median +Regional Costs

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark 11/12 Industry Upper Quartile Total Cost inc regional factors	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV13 70	Underground Cable 132KV	1,046	1,310	865	No	weighted down by relative volumes of gas top ups of repairs	11/12 Median +Regional Costs
CV13 71	Substation 132KV Inspection	500	114	414	Yes	• London have larger sites (more plant and equipment) and confined spaces	11/12 Median +Regional Costs
CV13 72	Substation 132KV repair	3,442	601	2,848	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	11/12 Median +Regional Costs
CV13 73	Switchgear All Types 132KV repair	1,292	528	1,069	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken	11/12 Median +Regional Costs
CV13 75	Transformers 132KV repair	1,135	357	939	Yes	• Low should cost: large potential scope of works. Review Should Cost scope against actual work undertaken eg oil samples v tap changer maintenance or repairs	11/12 Median +Regional Costs

Capex EPN

RIGs	Description	Benchmark DPCR 5 Target – 10%	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 10	LV Main (UG Plastic)	103,969	134,938	103,969	No	• Further improvement may require the contracts to be changed or the work brought in house.	11/12 Median-10%
CV3 13	LV service (UG)	1,067	1,156	1,067	Yes	• Include missing volumes for unmetered service replacement • Further improvement may require the contracts to be changed or the work brought in house. • Should cost for new service (without wider costs associated with service removals)	11/12 Median-10%
CV3 20	Cut Out (Metered)	203	536	258	No	• Renegotiate high contract rates or bring in house	Actual-10%

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark DPCR 5 Target – 10%	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 38	6.6/11kV RMU	13,018	15,505	13,018	Yes	<ul style="list-style-type: none"> Understand how to book cost to consequential assets Review material contract rates and specifications Review civil work apportionment and QoS elements of jobs Review contract rates 	11/12 Median-10%
CV3 48	6.6/ 11kV Transformer	14,145	16,968	12,693	Yes	<ul style="list-style-type: none"> Understand correct booking process for consequential asset Review material supply contract rates and specifications 	Actual
CV3 8	LV Poles	845	1,487	1,487	No	<ul style="list-style-type: none"> Bring in house Even with bringing contractor costs in house may still be higher than target due to shutdowns and complexity 	DCE Should Cost

Capex SPN

RIGs	Description	Benchmark DPCR 5 Target – 10%	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 19	LV UGB	4,233	3,550	4,233	Yes		11/12 Median-10%
CV3 24	6.6/11kV OHL (BLX or similar Conductor)	17,223	37,319	30,319	No	<ul style="list-style-type: none"> Currently use CCC (BLX) to mitigate risk from high tree volumes and transient faults. UCI to allow for short lengths. Investigate bringing contractor costs in house 	DCE Should Cost-Generator
CV3 27	6.6/11kV Poles	1,736	3,497	1,736	No		11/12 Median-10%
CV3 29	6.6/11kV UG Cable	91,670	124,427	91,670	Yes	<ul style="list-style-type: none"> Should costs selected excluding EFPIs and HV service disconnections 	11/12 Median-10%
CV3 38	6.6/11kV RMU	13,639	14,104	13,639	Yes		11/12 Median-10%
CV3 48	6.6/11kV Transformer (GM)	14,087	13,905	14,087	Yes		11/12 Median-10%

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark DPCR 5 Target – 10%	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 8	LV Poles	845	1,419	1,419	No	<ul style="list-style-type: none"> Investigate strategy of bringing contractor work in house 	DCE Should Cost

Capex LPN

RIGs	Description	Benchmark DPCR5 Target	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 10	LV Main (UG Plastic)	115,521	142,715	128,444	Yes		DCE Should Cost – 10%
CV3 13	LV Service (UG)	1,186	1,336	1,186	Yes	<ul style="list-style-type: none"> Full replacement costs excluding service removals 	11/12 Median
CV3 18	LV Board (WM)	9,862	13,578	13,578	No	<ul style="list-style-type: none"> Greater engineering on site as most jobs start as fault rather than issued as planned replacement 	DCE Should Cost
CV3 19	LV UGB	5,961	4,506	5,961	Yes		11/12 Median
CV3 20	Cut Out (Metered)	188	852	658	No	<ul style="list-style-type: none"> allow for higher volume of 3 phase cut outs in London 	Additional £400 for proportion of 3ph cut outs
CV3 29	6.6/11kV UG Cable	97,324	222,614	97,324	Yes	<ul style="list-style-type: none"> Should costs excluding EFPI replacement 	11/12 Median

Overview of Should Cost development

Oct 2012 – March 2013



RIGs	Description	Benchmark DPCR5 Target	Should Costs	ED1 target Inc regional costs	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV3 38	6.6/11kV RMU	15,262	24,578	22,121	No	<ul style="list-style-type: none"> Increase staff to reduce shortfall contractor hires Newly signed contract has not materially increased available SAP resources. Also risk of expensive average cost With limited contract resource, change to functional / ring fencing operating model to ensure capping staff are available. Risk to other capital works delivered in house 	DCE Should Cost – 10%
CV3 48	6.6/11kV Transformer (GM)	15,497	18,394	15,497	Yes	<ul style="list-style-type: none"> Same issue as above for RMUs 	11/12 Median

Overview of Should Cost development

Oct 2012 – March 2013



Trees EPN

RIGs	Description	11/12 Industry Median - 10%	Should Costs	ED1 target	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV14 7	Spans Inspected LV	106	100	106	No	<ul style="list-style-type: none"> Align the BTS and Brockwells contract to RIGs reporting (inspection and Cut) 	Industry Median – 10%
CV14 9	Spans Inspected HV	117	117	117	No	<ul style="list-style-type: none"> EPN South need a managed contract, currently reactive basis per feeder with a backlog of heavy infestation to clear 	Industry Median – 10%
CV14 11	Spans Inspected 33KV	126	67	126	Yes		Industry Median – 10%
CV14 13	Spans Inspected 132KV	118	82	118	Yes		Industry Median – 10%

Trees SPN

RIGs	Description	11/12 Industry Median - 10%	Should Costs	ED1 target	Is target feasible given current op. model?	Specific actions to achieve target	Input for ED1
CV14 7	Spans Inspected LV	106	99	106	No	<ul style="list-style-type: none"> Align the BTS and Brockwells contract to RIGs reporting (inspection and Cut) 	Industry Median – 10%
CV14 9	Spans Inspected HV	117	172	117	No	<ul style="list-style-type: none"> Bring the Brockwells contract in line with BTS - given that infestation is about the same or bring in house 	Industry Median – 10%
CV14 11	Spans Inspected 33KV	126	87	126	Yes		Industry Median – 10%
CV14 13	Spans Inspected 132KV	118	2,000	118	No	<ul style="list-style-type: none"> Current costs are exceptional while backlog recovered - a lower UCI through a managed service will be achievable when complete 	Industry Median – 10%

Note – Tree Cutting Unit costs will be split into inspected and cut – a combined inspections and cut costs divided by spans inspected was used to align with UK Power Networks current managed service contracts.

10. Appendix 2 Unit Costs Adjustments made to Targets (all 11/12 prices)

Capex EPN

Asset	Name	Voltage
Overhead Pole Line	LV Poles	LV
Switchgear	Cut Out (Metered)	LV
Transformer	6.6/11kV Transformer (GM)	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
845.28	1,487.29	1,902.41	1,236.21	1,487.29	Use Should Cost due to contractor Costs
202.87	536.32	277.36	394.97	257.66	10% stretch on Actual (Feb)
14,145.30	16,967.62	12,343.07	7,215.24	12,693.00	Use Actual (Original, now updated)

Capex SPN

Asset	Name	Voltage
Overhead Pole Line	LV Poles	LV
Switchgear	Cut Out (Metered)	LV
Overhead Pole Line	6.6/11kV OHL (BLX or similar Conductor)	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
845.28	1,419.40	1,673.51	1,471.76	1,419.40	Use Should Cost due to contractor Costs
202.87	-	363.98	397.62	257.66	Use EPN Cost
17,222.54	37,318.52	276,067.55	85,254.46	30,318.52	Should Cost less £7000 generation costs

Capex LPN

Asset	Name	Voltage
Cable	LV Main (UG Plastic)	LV
Switchgear	LV Board (WM)	LV
Switchgear	Cut Out (Metered)	LV
Switchgear	6.6/11kV RMU	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
115,521.34	142,715.16	147,756.36	85,655.56	128,443.64	Should cost less 10%
9,861.58	13,577.63	22,460.97	27,227.78	13,577.63	Should cost - london contractor costs
187.84	852.38	1,044.41	1,006.75	657.66	Additional £400 for proportion of 3ph cut outs
15,261.97	24,578.41	23,227.95	21,926.99	22,120.57	Should cost less 10%

Overview of Should Cost development

Oct 2012 – March 2013



I&M EPN

Asset	Name	Voltage
Protection Schemes	Repair & Maintenance	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
249.12	445.17	1,309.53	264.48	445.17	Should Cost

I&M SPN

Asset	Name	Voltage
Protection Schemes	Repair & Maintenance	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
266.45	436.11	1,349.07	118.30	436.11	Should Cost

I&M LPN

Asset	Name	Voltage
GM Switchgear (Exc CBs and X Type RMU)	Repair & Maintenance	HV
Protection Schemes	Repair & Maintenance	HV
GM Transformers	Repair & Maintenance	HV

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
900.29	450.48	271.38	293.69	450.48	Should Cost
296.85	1,190.22	573.05	429.59	1,190.22	Should Cost- pilot repairs
311.43	134.63	137.65	133.89	134.63	Should Cost

Overview of Should Cost development

Oct 2012 – March 2013



Faults EPN

Asset	Name	Voltage
LV Network	UG Cables (Non CONSAC) - Asset Repair/Replacement Required	
LV Network	All Other Switchgear, Plant & Equipment - Asset Repair/Replacement Required	

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
2,680.89	2,157.49	2,970.28	2,333.84	2,157.49	Should Cost
457.52	565.48	2,196.68	7,038.47	565.48	Should Cost

Faults SPN

Asset	Name	Voltage
LV Network	UG Cables (Non CONSAC) - Asset Repair/Replacement Required	
LV Network	All Other Switchgear, Plant & Equipment - Asset Repair/Replacement Required	

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost Feb 2013 (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
2,978.77	2,267.83	4,632.76	3,845.77	2,267.83	Should Cost
508.36	565.48	226.72	3,903.03	565.48	Should Cost

Faults LPN

Asset	Name	Voltage
LV Services (excluding cut out incidents)	Underground	
LV Network	UG Cables (Non CONSAC) - Asset Repair/Replacement Required	
LV Network	All Other Switchgear, Plant & Equipment - Asset Repair/Replacement Required	
HV Network (11 kV & 20 kV)	UG Cables - Asset Repair/Replacement Required	

RIO ED1 Target UCI (£/unit)	DCE should cost (£/unit)	Actual unit cost (£/unit)	Actual unit cost Mar 2013 (£/unit)	UCI Selected (£/unit)	Decision
1,274.33	2,570.13	2,240.20	8,344.71	2,058.34	Actual less 10%
2,978.77	3,238.21	7,695.40	2,965.73	3,238.21	Should Cost
508.36	-	356.95	5,114.85	622.03	EPN +10%
5,026.99	6,173.23	7,811.89	9,185.73	6,173.23	Should Cost