REPEX AND OPEX INITIATIVES TO MANAGE NETWORK SAFETY AND ADDRESS ALARP OBLIGATION

Version 6.3

		CY11 - 15																		CY16 - 20															
				Asset failure 2014				ZSS failure 2014	Incident involving public 2014			Asset failure trend				ZSS failure trend	Incident involving public trend								Asset failure per annum				ZSS failure per annum	Incident involving public per annum			
					Fire starts 2014								Fire starts trend												Fire starts per annum								
Asset Class Description Repex Categories	Asset Code	Replacement Capex Actual $'M Real 15 11-15	Assets at High Risk of Failure in 2015	no fire	fire on asset	vege fire from asset failure	vege fire from contact: vege, animal, 3rd party	major ZSS event indices	HV injection	Electric shocks	Access breach	no fire	fire on asset	vege fire from asset failure	vege fire from contact: vege, animal, 3rd party	lead indicator substation major fire or explosion	HV injection	Electric shocks	Access breach	Assets at High Risk of Failure in 2020 without rep. capex	Replacement Capex Forecast $'M Real 15 16-20	Assets at High Risk of Failure in 2020 with replacement capex	Opex Changes between Current v Next Reg Period	no fire	fire on asset	vege fire from asset failure	vege fire from contact: vege, animal, 3rd party	major ZSS event indices	HV injection	Electric shocks	Access breach	Comments
pole top structures	PF & RX	**102**	18%	**103**	**133**	**4**	**5**		**44**			↑	↑	↑	↑		↑			27%	**98**	10%	Pole top camera inspections will improve condition assessment and should result in fewer equipment failures. Higher inspection volumes (mid-cycle Aerial) will improve coverage across the asset base to better target replacement.	**54**	**53**	**1**	**5**		**45**			The combined spend in pole fire mitigation and cross arm replacement will be maintained to address deteriorating safety/fire starts. Inspection methodology and inspection volumes have been improved / increased.
pole replacement & staking	RP & RR	**36**	7%	**3**	**incl above**	**incl above**	**4**		**incl above**	**incl below**		↑			↑					14%	**39**	11%	Maintain current pole management practice of staking poles once limited life status is reached.	**3**	**incl above**	**incl above**	**4**		**incl above**	**incl below**		No Increase in pole failures has been forecast current codition assessment techniques are proving to be highly effective
overhead conductor	RO Bare conductor	**0**	32%	**34**	**incl above**	**incl above**	**9**		**incl above**			↑			↑					48%	**1**	46%	Maintain current general practice of cyclic inspection, repair on failure, replace on condition (noting current practice does vary across the asset class).	**51**	**incl above**	**incl above**	**9**		**incl above**			The replacement of HV ABC will result in fewer fire starts from conductor faiulres. The program to replace connectors will also address HV injection from conductor failure.
	PD HV tie failure			**9**								↑												**12**								
underground cable	RU, RX, RS	**38**	15%																	20%	**43**	19%	Maintain current general practice of run to failure, then repair or replace. Some increase in conditions monitoring for some asset classes, particularly HV cable testing.									A failure rate increase is forecast due to more cable near end of life but with little or no safety consequence.
transformers	distr (RH)	**11**	6%		**0**	**0**							→	→						15%	**14**	8%	For distribution transformers, maintain mandatory inspection and reactive maintenance and replacement.		**1**	**0**						ZSS transformer replacement occurs before catestrophic failure avoiding safety risk to personnel and public. Distribution transformer failure does not present a significant safety risk
	ZSS (RS & PZ)	**21**	34%					**300**								→				52%	**55**	37%	Additional condition monitoring is proposed as more equipment enters the last 15% of life, to guide optimum timing to replace.					**309**			
switchgear	distr (RH, RX). RS	**35**	16%	**11**	**33**	**18**						↑	↑	↑						28%	**48**	23%	For distribution switchgear, maintain "run to failure" with targeted replacement program.	**16**	**38**	**26**						Zone substation switchgear is targeted for replacement before catestrophic failure occurs, thereby avoiding safety risk to personnel and public. HV air-break switchgear replacement is partly to addess safety risks that occur during maintenance. Safety risks to public from HV swithcgear failures are not significant.
	HV fuse failure			**15**	**1**	**0**						↑	↑	→									Additional condition monitoring is proposed as more equipment enters the last 15% of life, to guide optimum timing to replace.	**22**	**2**	**1**						
	ZSS (RS)	**24**	51%					**342**								↑				64%	**32**	47%	No change					**396**			
services	RM	**69**	5%	**57**	**incl above**					**61**		↑	↑					↑		8%	**34**	0%	No change	**50**	**incl above**					**70**		The completing of Neutral Screened Conductors replacement program should significantly improve shocks. Whilst few aged assets, we have a specific type that are still at a risk to failure.
protection and control	PQ, PR, PZ, RC	**31**	21%																	38%	**34**	22%	No change									
other					**1**	**11**	**0**						↓	↑	→										**1**	**11**	**0**					
Subtotal Asset Replacement (excl.ZSS Primary)		**367**																			**398**												
ZSS primary assets	RC, RS	**8**	18%								**8**								↑	24%	**10**	18%	No change								**16**	Increased rsik of safety breach
Subtotal Asset Replacement (incl. ZSS Primary)			**19%**	**232**	**168**	**33**	**18**	**642**	**44**	**61**	**8**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**28%**		**23%**		**207**	**95**	**39**	**18**	**705**	**45**	**70**	**16**	
Non VBRC Safety Projects	CCTV	**1**																			**6**										**-4**	CCTV is used to address increased safety risk
Subtotal Non VBRC Safety		**1**																			**6**			0	0	0	0	0	0	0	-4	
Operational Technology Safety	Service Mains Deterioation	**1**																			**4**										**-35**		Identifying unsafe situations before shocks occur via new technology. Assessed as ALARP
	In Meter Capabilities	**0**																			**2**										**incl above**		Identifying unsafe situations before shocks occur via new technology. Assessed as ALARP
	LiDAR	**1**																			**7**					**-3**	**-1**						Should lead to detection of trees not to code and some asset failures - Council still to action with UE supplied data
	OT Security	**0**																			**6**										**-4**	Program to address increased security risk
	Intelligent Nerwork Device	**0**																			**5**										**incl above**		Identifying unsafe situations before shocks occur via new technology. Assessed as ALARP
Operational Technology Reliability	2 projects	**0**																			**7**												
Operation Technology Other	ZSS transf monitoring	**0**																			**2**												
	Various	**2**																			**8**												
Subtotal Operational Technology		**4**																			**41**			0	0	-3	-1	0	0	-35	-4	
Reliability Performance	Clashing	**1**																			**4**					**-2**						Reduce potential fire starts
	Animal proofing	**7**																			**10**						**-2**					Animal proofing only, will not affect third party, vege etc.
	Other	**17**																			**21**												
Subtotal Reliability Performance		**24**																			**36**			0	0	-2	-2	0	0	0	0	
Environmental	PE	**2**																			**5**												
Power Quality	PQ	**5**																			**8**												
TS Rebuild replacement																					**5**												
Subtotal "Other Repex"		**45**																			**112**			0	0	-5	-3	0	0	-35	-4	
VBRC Safety Projects	Conductors	**4**																			**4**												Impact included above under overhead conductor
	HV ABC	**1**																			**30**			-4	-2	-2						Targetted replace should reduce failures
	LV ABC	**4**																			**1**			-1	0	0						Minimal impact
	Ampact (unmodelled)	**5**																			**5**			-1		-1						Reduced conductor/connector failure
	Clashing / spreaders	**2**																			**0**			0	0	0						Reduced repeat clashing, immaterial expenditure under VRBC
	Dampers	**3**																			**5**					0						VRBC Obligation - minimal Impact for remainder of program
	REFCL's	**3**																			**7**					-5						Reduced fire starts in United Energy's highest risk areas
	SWER	**2**																			**0**												
Subtotal VBRC Safety Projects		**24**																			**53**			-6	-2	-8	0	0	0	0	0	
TOTALS PER INDICATOR		**437**	**Actual 2014**	**232**	**168**	**33**	**18**	**642**	**44**	**61**	**8**										**564**		**Forecast**	**201**	**93**	**26**	**15**	**705**	**45**	**35**	**8**	
TARGETS			**Target**	**210**	**88**	**21**	**15**	**710**	**45**	**80**	**8**												**Target**	**210**	**93**	**27**	**15**	**710**	**45**	**35**	**8**	
TOTALS PER INDICATOR GROUP			Total asset failure Actual 2014	**433**		Total Fire Starts Actual 2014	**219**		Total Incident involving public Actual 2014		**113**												Total asset failure Forecast 16-20	**320**		Total Fire Starts Forecast 16 - 20	**134**		Total Incident involving public Forecast 16 - 20		**88**	
TARGETS PER INDICATOR GROUP			Total asset failure Target 11 - 15	**319**		Total Fire Starts Target 11 - 15	**124**		Total Incident involving public Target 11 - 15		**133**												Total asset failure Target 16 -20	**330**		Total Fire Starts Target 16 - 20	**135**		Total Incident involving public Target 16 - 20		**88**	