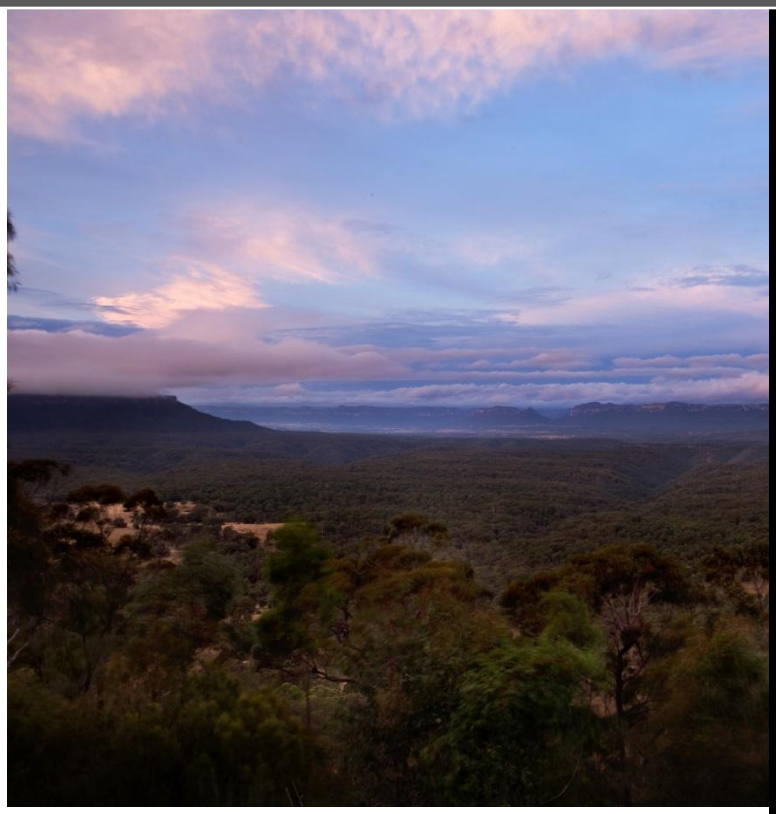
2013/14

End of Fire Season Report



Ian Fitzpatrick

Manager Network Risk Strategy

31st March 2014

Executive Summary

Well above normal temperatures, and heatwave conditions in January[1], along with below average rainfall has again been a feature of this year and particularly this fire season.

These conditions have contributed to similar results to those reported in 2012/13.
The 2013/14 YTD (to 31/03/2104) season recorded 335 network initiated fires compared to 354 for the full 2012/13 year. The results for both years are likely to be very similar when the 2013/14 full year report is completed.

The majority of the 2013/14 network initiated fires occurred in the Southern (98) and Northern (89) and North Coast (74) regions. The leading causes of fires based on individual cause codes are:

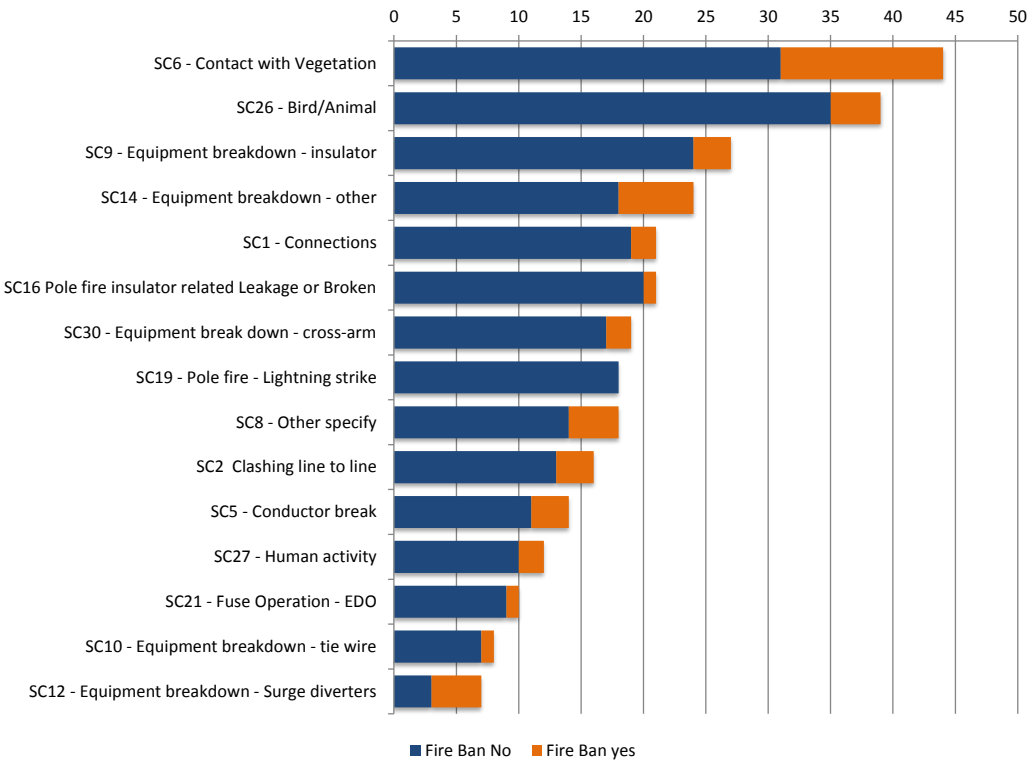
1. Vegetation contact (46)
2. Bird/animal (43)
3. Storm/lightning (32)

However if we group all codes associated with asset failure it shows these, as a group, cause the majority (60%) of all fires reported.

Contact with vegetation attributed to the majority of fires which occurred on a Total Fire Ban (Toban) day. This is likely to be due to the fact that both Toban declarations and Tree failures are related to high wind speeds.

Causes

Figure 1: Top 15 Cause Codes 2013/14 YTD

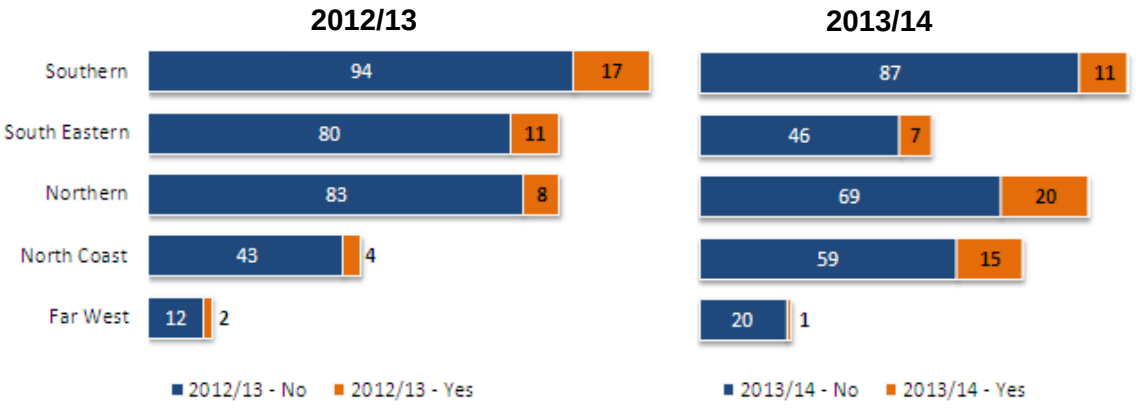


[1] 2014 BOM Special Climate Reports 47,48

Fire Ignition Locations

Most years the grouping of fire ignitions favoured the Southern regions. However in 2013/14 there was a notable rise in the amount of fire ignitions in the North Coast region, indicative of the unusual weather conditions leading to an increased number of Toban days in the Northern and North Coast Regions.

Figure 2: Fire Ignitions by Region and Toban Days Comparison 2012/13 to 2013/14 YTD



Season Characteristics

BOM Summary

The bureau reported September 2013 as being the hottest on record.
October, November and December had well above average temperatures. January had maximum and minimum temperatures well above average and this resulted three[2] heat wave events across most of Australia including NSW. The warm days were associated with persistently dry, clear conditions and several significant heat events. Notably, numerous high temperature records were broken in northern NSW.

Most of the state recorded below average rainfall, with the driest conditions in the north with the driest summer conditions on record, in areas including Byron Bay, Coffs Harbour and Mudgee through to Nowra.

Figure 3: BOM Temperature Anomaly Sep to Feb 2014

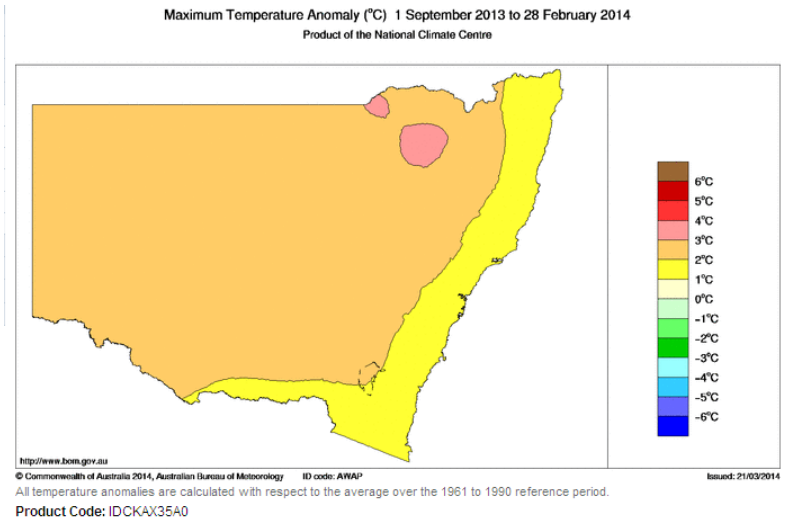
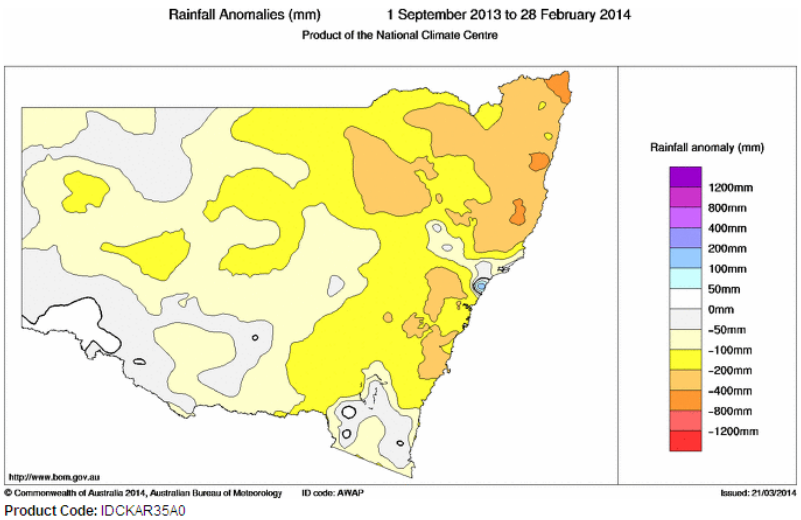
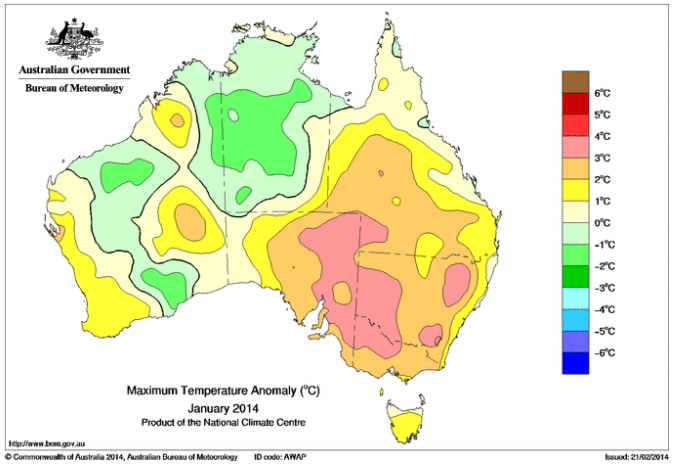


Figure 4: BOM Rainfall Anomoly Sept to Feb 2014



[2] 2014 BOM Special Climate Reports 46,47,48

Figure 5: January 2014 Results[3] - Anomalies of mean daily maximum temperature



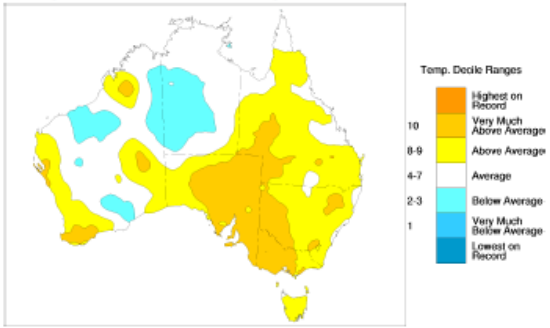
All temperature anomalies are calculated with respect to the average over the 1961 to 1990 reference period.

Product Code: IDCKAX1AA0

Temperatures

January was yet another warmer-than-average month for Australia, and the eighteenth consecutive month (since August 2012) with temperature above the 1961–1990 average. The national area-averaged maximum temperature anomaly was +0.99 °C, the minimum temperature anomaly was +0.85 °C and the mean temperature anomaly was +0.92 °C. Maximum temperature anomalies were within the ten highest for January in New South Wales, Victoria, Tasmania and South Australia while mean temperature anomalies were eighth-highest on record for Victoria and South Australia and the ninth-highest on record for Queensland.

Decile rank of mean daily maximum temperature in January 2014



Record highest January daily maximum temperature

		New record		Old record	Years of record
New South Wales					
048031	Collarenebri (Albert St)	48.0 on 3rd		47.8 on 15th in 1939	101
052020	Mungindi Post Office	48.2 on 3rd		46.8 on 12th in 2013	49
054003	Barraba Post Office	44.9 on 3rd		41.3 on 4th in 1973	48
054104	Pindari Dam	41.5 on 5th		40.2 on 8th in 1994	42
055024	Gunnedah Resource Centre	45.9 on 3rd		42.3 on 13th in 2013	64
055049	Quirindi Post Office	45.1 on 3rd		42.9 on 12th in 2013	47
055136	Woolbrook (Danglemah Road)	37.5 on 3rd		36.5 on 12th in 2013	42
056013	Glen Innes Ag Research Stn	36.0 on 3rd		34.5 on 27th in 1981	40
056018	Inverell Research Centre	41.1 on 3rd		39.9 on 25th in 2003	49
061051	Murrurundi Post Office	41.2 on 3rd		40.9 on 12th in 2013	49
062013	Gulgong Post Office	42.3 on 3rd		42.0 on 18th in 2013	40
064008	Coonabarabran (Namoi Street)	44.0 on 3rd		42.6 on 4th in 1973	58
064009	Dunedoo Post Office	44.2 on 3rd		43.7 on 12th in 2013	46
072043	Tumbarumba Post Office	40.5 on 16th		40.0 on 6th in 2013	46
073007	Burrinjuck Dam	42.5 on 16th	=	42.5 on 12th in 2007	49

[3] BOM Monthly Weather Review – Australia – January 2014

RFS NSW Summary

It was a hard and fast start to the fire season. July[4] was one of the hottest on record and predictions from the weather bureau revealed that it would be a lot drier than at first thought. In the RFS Northern Tablelands and New England Regions which is the Essential Energy Northern Region the official bush fire danger period was brought forward to 1 August.
In August fire crews battled more than 350 blazes. In September several significant fires took off in the north, mid-north coast and around Sydney.
1 October marked the official start to the bush fire season in NSW, however many areas had already seen significant fire activity. In fact October will be remembered as one of the most significant fire emergencies NSW has experienced for many years.

In the period 1 August to 31 December two people lost their lives, over 224 homes were lost and around 170 other homes were damaged. This was across NSW involving a number of fires early in the season.

Figure 6: Salt Ash Fire, near Port Stephens (Not Essential Energy Region)

The picture above is the result of the Salt Ash fire near Port Stephens 13 October 2013.
Although **not in Essential Energy's area**, fire investigators determined that the fire started as a result of powerlines arcing in the high winds.

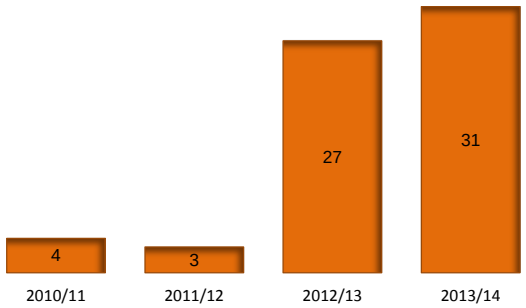
[4] RFS Bush Fire Bulletin Volume 35 - 2014

Essential Energy Fire Related Date

Total Fire Ban Days (TOBAN days)

The fire weather conditions resulted in a relatively high number of Total Fire Ban days being declared by NSW Rural Fire Services (RFS). 31 TOBAN days for 2013/14 compared to 27 TOBAN days 2012/13.

Figure 7: Total Fire Ban Days Declared 2010/11 to 2013/14



A total of 54 network fire ignitions were recorded on TOBAN days with 20 of those in the northern region.

Figure 8: Fire ignitions on TOBAN days 2013/14

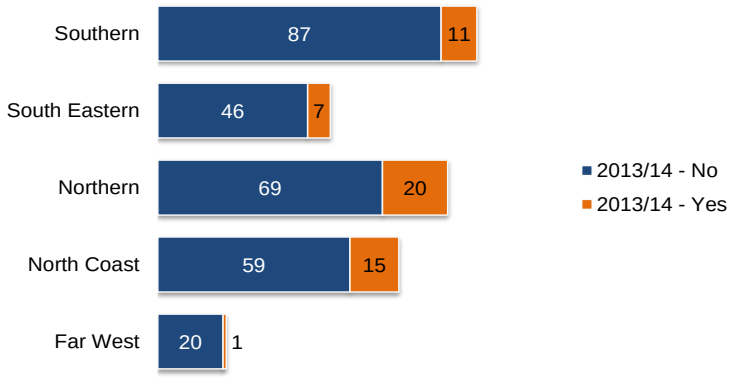
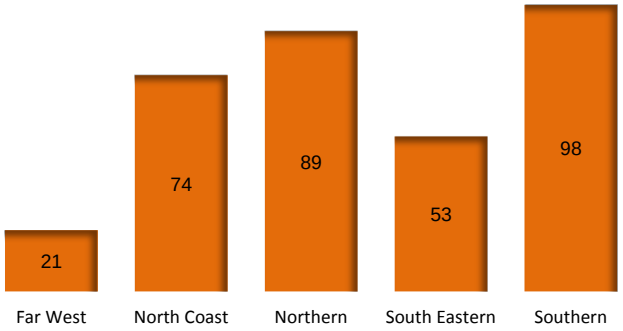


Figure 9: Total Fire Ban Days by regions - 2009/10 to 2013/14



Network Related Fire Ignitions

Of the 335 network initiated fires, the majority occurred in the fire danger period, with the peak months being January (70), November (59) and February (50).

Figure 10: 2012/13 and 2013/14 (to 31/3/2014) Fire ignitions comparison

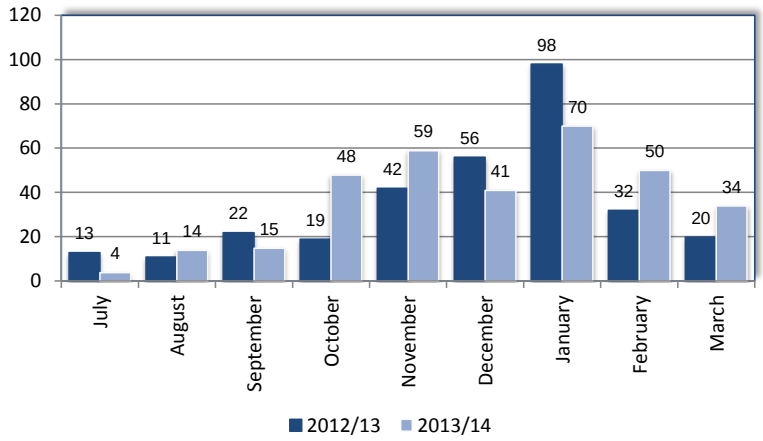


Figure 11: 2013/14 (to 31/3/2014) Fire ignitions by Month

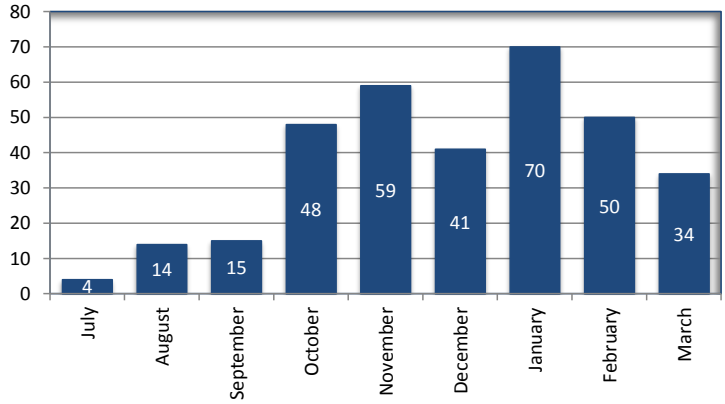
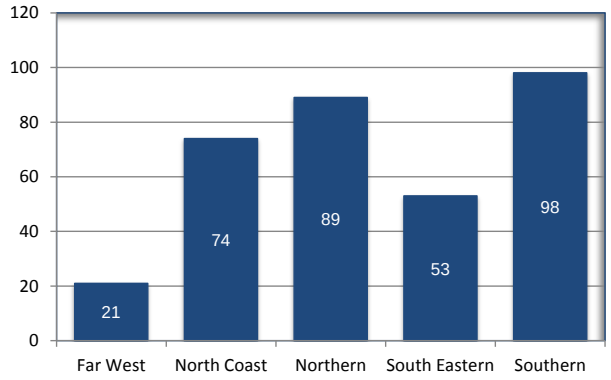


Figure 12: 2013/14 (to 31/3/2014) Fire Ignitions by Region



Network Related Fire Ignitions – Causes

The primary causes for network initiated fire ignitions revealed that, Asset breakdown fire ignitions accounted for 202 or (60%) of the 335 fires.
The remainder were attributed to vegetation, storm damage, bird/animal damage and human activity.

Figure 13: Network initiated fire ignitions – Primary Cause

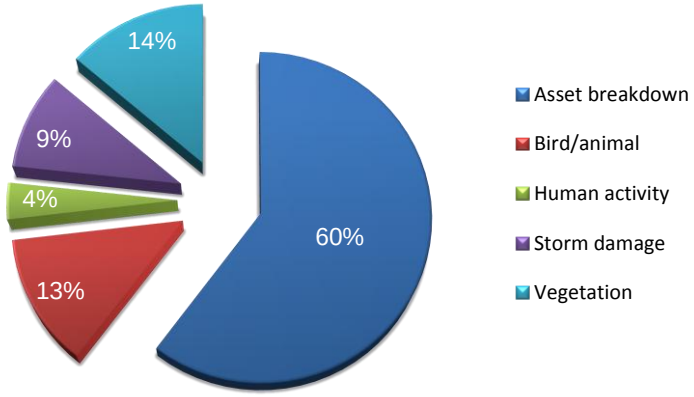


Figure 14: Table – Network related fire ignitions cause comparison 2013/14 to 2012/13

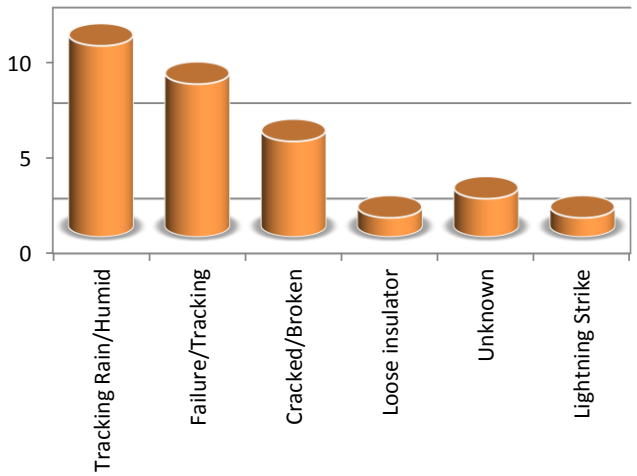
Count of Incident date	Column Labels	
Row Labels	2012/13	2013/14
SC26 - Bird/Animal	55	39
SC6 - Contact with Vegetation	35	44
SC19 - Pole fire - Lightning strike	35	18
SC9 - Equipment breakdown - insulator	23	27
SC14 - Equipment breakdown - other	21	24
SC1 - Connections	22	21
SC8 - Other specify	20	18
SC5 - Conductor break	22	14
SC30 - Equipment break down - cross-arm	16	19
SC16 Pole fire insulator related Leakage or Broken	10	21
SC27 - Human activity	18	12
SC2 Clashing line to line	10	16
SC21 - Fuse Operation - EDO	14	10
SC12 - Equipment breakdown - Surge diverters	15	7
SC10 - Equipment breakdown - tie wire	11	8
SC33 - Pole failure	5	5
SC24 - Fuse connections	2	7
SC4 - Line dislodged - contact with above ground components	1	5
SC7 - Contact with foreign object	2	4
SC22 - Fuse Operation - Other	4	2
SC29 Pole fire Conductor tie Broken	1	4
SC20 - Pole fire - unknown	3	2
SC11 - Equipment breakdown - brackets, bolts, steelwork	1	4
SC17 - Pole fire - crossarm related	4	
SC18 - Pole fire - groundline	1	2
SC3 - Line dislodged - contact to ground	1	2
SC15 - Equipment breakdown - unknown	1	
SC25 - Fuse assembly break	1	
Grand Total	**354**	**335**

Asset breakdown analysis 2013/14

Insulator failure

Analysis of the 2013/14 fire ignition data (excluding bird/animal and vegetation issues), revealed that insulator failure counted amongst the highest causes of asset breakdown fire ignitions. Out of the 27 insulator fire ignition causes, 10 were due to tracking due to contamination, 8 were due to the insulator failing and then tracking, 5 were due to the insulator mechanical failure or being cracked/broken, 1 due to a direct lightning strike, 1 due to the insulator being loose and 2 due to unspecified insulator failure.

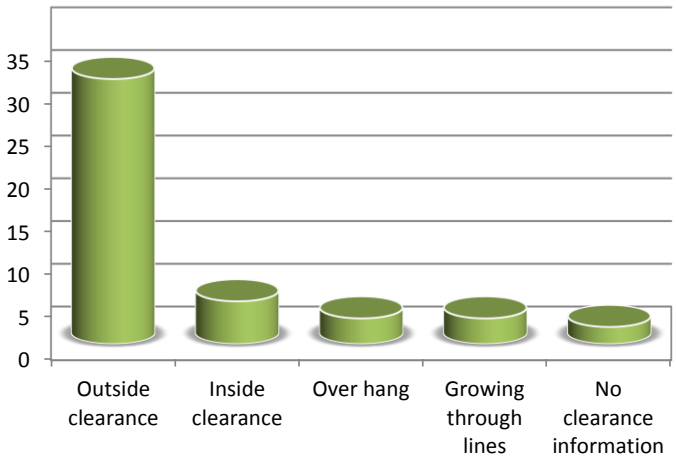
Figure 16: Insulator failure failure/tracking related fire ignitions



Vegetation

Vegetation interfering with powerlines continues to cause fires and this season, 44 of the 335 fires were associated with vegetation. From information provided by staff it appears that the majority of these (70%) are a result of vegetation outside clearances such as trees falling or windborne debris associated with high winds or storms.

Figure 17: Vegetation related fire ignitions



Conductor Clash

Conductor clash has accounted for 16 fire ignitions. 11 of these were HV conductors clashing and 8 of those due to storms and strong windy conditions. 5 of the conductor clash fire ignitions were due to LV conductors clashing. Essential Energy undertook a review of the LV spreader installation program with an expansion of the program to all rural locations with priority on locations of highest risk. In 2012/13 a total of 2525 LV spreaders were fitted to rural LV spans and 2013/14 (to March 2014) a total of 4472.

EDO Failure

There were 12 fire ignitions due to HV fuses blowing and in most cases molten metal falling to the ground had resulted in those ignitions.
Investigations have found that in 6 out of the 12 instances, birds/animals had made contact with the line causing the fuses to blow.
The EDO Replacement Program and the Substation Refurbishment Program are part of our bushfire mitigation initiative. The programs refurbish or replace EDO fuse sites within high fire prone areas and those within one kilometer of the coastline. Silicon rubber expulsion drop out fuse units are fitted with sparkless fuse elements. This program results in older fuse carriers manufactured with materials prone to swelling when aged being replaced with newer fiberglass tubes.
At April 2014 a total of 2561 EDO HV fuses have been refurbished or replaced. Further research is continuing into other viable HV fuse options, such as sealed units, for high risk locations.

Fires by Voltage

In 2013/14 YTD (to 31/03/2014) the majority of fires occurred from 11kV lines; however this is the highest proportion of lines on the network.

From the graph below the SWER network performs very well in regard to responsibility for fire ignitions.

Figure 18: Fire by Voltage Level