NON COMPLIANCE PROFILING

DEAKIN ENERGY

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Hypothesis 1:

The proportion of lines that are maintained by the Company which is non-compliant are more compared to lines that are maintained by the council that is non-compliant.

H0: The True proportion of lines that are maintained by the Company which is non-compliant are less than or equal when compared to lines that maintained by the council that is non-compliant. ($\pi_1 - \pi_2 <= 0$)

H1: The True proportion of lines that are maintained by the Company which is non-compliant are less than or equal when compared to lines that are maintained by the council that is non-compliant. ($\pi_1 - \pi_2 > 0$)

Stats

Level of Significance = 0.05

Sample proportion 1 = 55.47%
Sample proportion 2 = 44.53%

Standard error = 1.10%

P value : 0.000 , Z value = 9.9530

Since P value > Level of Significance, **we reject H0.**

Conclusion

With a 5% probability of an error, we can say that the lines that are maintained by the Company which is non-compliant are more compared to lines that are maintained by the council that is non-compliant.

So the next question would be why what percentage they are higher than council maintained lines. So 95 % level of confidence we say that non-compliance rate of lines that are managed by the company are 8.5% to 12.7% more than the lines that are managed by the council.

Hypothesis 2:

The non-compliance rate is more when there is no sign of contact with the electric line compared to when there are is signs of contact with the electric line.

H0: True proportion of electric lines that are non-compliant have no signs of electric contact are less than or equal to the lines that are non-complaint and have electric line contact. ($\pi_1 - \pi_2 <= 0$)

H1: True proportion of electric lines that are non-compliant have no signs of electric contact that are less than or equal to the lines that are non-complaint and have electric line contact. ($\pi_1 - \pi_2 > 0$)

Stats

Level of Significance = 0.05

Sample proportion 1 = 71.4%
Sample proportion 2 = 28.59%

Standard error = 1.20%

P value : 0.000 , Z value = 35.711

Since P value < Level of Significance**, we reject H0.**

Conclusion

With a 5% probability of an error, we can say that the Non-compliance rate is more when there is no sign of contact with the electric line compared to when there are is signs of contact with the electric line.

So answering the difference of the proportions, with 95% confidence, we can say that the true proportion of non-compliant lines that have no electric contact are 40.47% to 45.17% more than the lines that have electric line contact.

Hypothesis 3:

The non-compliance rate is more when there is no sign of contact with the electric line compared to when there are is signs of contact with the electric line.

H0: True proportion of electric lines that are non-compliant have no signs of electric contact are less than or equal to the lines that are non-complaint and have electric line contact. ($\pi_1 - \pi_2 <= 0$)

H1: True proportion of electric lines that are non-compliant have no signs of electric contact that are less than or equal to the lines that are non-complaint and have electric line contact. ($\pi_1 - \pi_2 > 0$)

Stats

Level of Significance = 0.05

Sample proportion 1 = 71.4%
Sample proportion 2 = 28.59%

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Conclusion

With a 5% probability of an error, we can say that the Non-compliance rate is more when there is no sign of contact with the electric line compared to when there are is signs of contact with the electric line.

So answering the difference of the proportions, with 95% confidence, we can say that the true proportion of non-compliant lines that have no electric contact are 40.47% to 45.17% more than the lines that have electric line contact.

Hypothesis 4:

At the time of inspection, the proportion of non-compliant vegetation that was affecting the span (this does not meet the classification of HRNC) was more than the proportion of non-compliant vegetation affecting the span that was considered to be of a high-risk nature.

H0: True proportion of non-compliant vegetation that was affecting the span (this does not meet the classification of HRNC) was less than or equal to the proportion of non-compliant vegetation affecting the span that was considered to be of a high-risk nature. ($\pi_1 - \pi_2 <= 0$)

H1: True proportion of non-compliant vegetation that was affecting the span (this does not meet the classification of HRNC) was more than the proportion of non-compliant vegetation affecting the span that was considered to be of a high-risk nature. ($\pi_1 - \pi_2 > 0$)

Stats

Level of Significance = 0.05

Sample proportion 1 = 55.32%
Sample proportion 2 = 44.68%

Standard error = 1.08%

P value : 0.000 , Z value = 35.711

Since P value < Level of Significance, **we reject H0.**

Conclusion

With a 5% probability of an error, the True proportion of non-compliant vegetation that was affecting the span (this does not meet the classification of HRNC) was less than or equal

to the proportion of non-compliant vegetation affecting the span that was considered to be of a high-risk nature.

Hypothesis 5:

The non-compliance proportion is higher for lines that are declared high bush fire areas than that of any other Declarations.

H0: non-compliance proportion lines that are declared high bush fire area are less than are equal to that of other any other Declarations.. ($\pi_1 - \pi_2 <= 0$)

H1: non-compliance proportion is higher for lines that are declared high bush fire areas than that of any other Declarations.
($\pi_1 - \pi_2 > 0$)

Stats

Level of Significance = 0.05

Sample proportion 1 = 54.49%
Sample proportion 2 = 45.51%

Standard error = 1.08%

P value : 0.000 , Z value = 35.711

Since P value < Level of Significance**, we reject H0.**

Conclusion

With a 5% probability of an error, the non-compliance proportion is higher for lines that are declared high bush fire areas than that of other Declarations.

Analysis for non-compliance with Network type

Statements from data observations and questions.

1. **The non-compliance rate is the same for network type ANS, PC, and UE**
2. **The non-compliance rate is the same for network type CP and JEN**
3. **What is the rate of non-compliance for each network type?**

1. The non-compliance rate is the same for network type ANS, PC, and UE.

Test results between ANS and PC.

Stats

Z value - -0.177, p value - 0.8589

Decision, = p value > 0.05 (Level of Significance) fail to reject null hypothesis)

The proportion of ANS and PC is the same.

Test results between ANS and UE.

Z value - -0.177, p value -0.8589

Test results between ANS and UE.

Z value – (-5.48), p value - 0

Decision, = p value > 0.05 (Level of Significance) reject null hypothesis)

The proportion of ANS and PC is not the same.

Conclusion

The proportion of non-compliance is the same between ANS and PC and not UE

2. The non-compliance rate is the same for network type CP and JEN

Test results between CP and JEN.

Stats

Z value – (-2.45), p value - 0

Decision, = p value > 0.05 (Level of Significance) reject null hypothesis)

Conclusion

The proportion of CP and JEN is the same.

3. What is the rate of non-compliance for each network type?

The true rate of non-compliance for ANS network type lines will be 10.41% to 11.70%, for CP line will be approximately between 65% to 72.77%, for JEN line it is between 21% to 24.89%, for PC line it is between 8.80% to 9.89% and for UE it is 16.51% to 18.26%.

Other key patterns we found in the data.

- The non-compliance rate is increasing for every financial year, it was 5.60 to 7.05% in 2017-18, it was 14.33% to 15.42% in 2018-19, and 15.68% to 17.16% in 2019-20
- The rate of non-compliance for lines with vegetation span is between 13.75%, 14.54%
- The rate of non-compliance for lines that have undergone hazard assessment is between 16% to 17%. But non-compliance of lines with hazard assessment couldn't be done because of CLT.
- The non-compliance rate of HBRA inspection is 5.42% to 6.14% whereas it is between 23.32% to 24.74% for LBRA type of inspection.