INVESTIGATING COMMITTEE DECISION

COMPLAINT ABOUT PETER WASTNEY

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Confidential to the parties

In accordance with:
Chartered Professional Engineers of New Zealand Act 2002
Chartered Professional Engineers of New Zealand Rules (No 2) 2002

Prepared by
Cliff Boyt FEngNZ (Life)
Chair of the Investigating Committee

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Members of the Investigating Committee

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engineering new zealand
Institute of Engineering Professionals

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EXECUTIVE SUMMARY

1. Peter Wastney CPEng[1] was a Waka Kotahi NZ Transport Agency (**Waka Kotahi**) appointed Heavy Vehicle Specialist Certifier (**HVSC**). In 2016, he was engaged to provide a design and certification for a truck trailer draw-beam towing connection (**draw-beam**) to comply with New Zealand Standards 5446:2007 (**the Standard**).
2. On 27 August 2017, the draw-beam separated while the vehicle was travelling at speed on a highway. Mr Wastney's HVSC appointment was suspended by Waka Kotahi following this incident.
3. In February 2019, Waka Kotahi raised concerns with Engineering New Zealand that Mr Wastney acted incompetently and/or negligently when he certified that the draw-beam was compliant with the Standard.

DECISION

4. We do not consider there are any grounds to dismiss the complaint under Rule 57 of the Chartered Professional Engineers of New Zealand Rules (No 2) 2002 (**the CPEng Rules**). Accordingly, we refer the complaint to a disciplinary committee under Rule 60(a).

[1] Mr Wastney ceased to be a Chartered Professional Engineer on 13 May 2019.

BACKGROUND

COMPLAINT

5. Waka Kotahi first spoke to Engineering New Zealand about their intention to raise concerns in April 2018.
6. In February 2019, Waka Kotahi raised concerns with Engineering New Zealand about Mr Wastney. The complaint relates to a draw-beam which separated when the truck-trailer it connected was travelling along the Kohatu-Kawatiri Highway to Nelson. Before the incident, the draw-beam was certified by Mr Wastney as road-safe.
7. Waka Kotahi is concerned Mr Wastney acted incompetently and/or negligently when he designed and later certified the draw-beam towing connection as compliant with the Standard.
8. On 14 May 2019, Mr Wastney voluntarily cancelled his registration as a Chartered Professional Engineer. Even though Mr Wastney cancelled his registration, because Mr Wastney was a Chartered Professional Engineer when he certified the draw-beam, Engineering New Zealand, in its capacity as the Registration Authority for Chartered Professional Engineers, has jurisdiction to investigate this matter and, if appropriate, impose disciplinary orders.[2]

ADJUDICATOR'S DECISION

9. After an initial investigation, the complaint was referred to Peter McCombs CPEng DistFEngNZ IntPE(NZ), Chair of Investigating Committees acting as Adjudicator.
10. The Adjudicator considered that there were no grounds to dismiss the complaint, and formal investigation was warranted.

INVESTIGATING COMMITTEE

11. Following the Adjudicator's decision, the complaint was referred to this Investigating Committee for formal investigation.
12. The members of the Investigating Committee are:

    Cliff Boyt FEngNZ (Chair)

    Alan Nicholson FEngNZ

    Matt Bishop CMEngNZ CPEng IntPE(NZ)
13. The Investigating Committee considered all the information provided to Engineering New Zealand by the parties including:

    a. Mr Wastney's draw-beam certification file
    b. Sandbox Consulting Report dated 14 September 2017, commissioned by NZTA, and
    c. Mr Wastney's response to the complaint.

[2] Chartered Professional Engineers of New Zealand Act 2002, s 20(3).

INFORMATION GATHERED

ENGAGEMENT

14. On 16 June 2016, while still a Waka Kotahi-appointed HVSC and a Chartered Professional Engineer, Mr Wastney certified the draw-beam was secure and could maintain connection between towing vehicles and drawbar trailers, per the Standard. The certification stated that the draw-beam complied with the four requirements of the Standard – longitudinal force, longitudinal fatigue force range, side force and vertical force.
15. On the same day, Mr Wastney wrote to the truck owner advising he had issued the certificate of compliance. The letter included three photos of the fabricated draw-beam.

INCIDENT

16. On 27 August 2017, the draw-beam separated while the truck travelled along the Kohatu-Kawatiri Highway to Nelson. The trailer travelled some distance along the road before colliding with a bank.

SANDBOX CONSULTING REPORT

17. Waka Kotahi engaged Sandbox Consulting Ltd (**Sandbox Consulting**) to investigate how and why the draw-beam had failed.
18. On 31 August 2017, Sandbox Consulting's investigators inspected the truck-trailer units and visited the scene. The investigators measured the draw-beam, truck chassis, auxiliary crane frame, and general arrangement of the truck-trailer unit.
19. On 14 September 2017, Sandbox Consulting issued a report about their investigation into the cause of the draw-beam failure. A Finite Element Analysis (**FEA**) was the primary tool used in Sandbox Consulting's assessment of the incident.
20. Sandbox Consulting's FEA showed stress levels which significantly exceeded the material yield stress and predicted the draw-beam would fail well before its required design life. In Sandbox Consulting's view, the separation of the truck and the trailer was caused by the process of metal fatigue that resulted in a catastrophic rupture of the draw-beam.
21. The report referred to a relevant standard about fatigue assessment requirements which recommended a design life for a draw-beam of 2×10^6 load cycles.[3] Sandbox Consulting estimated the draw-beam in question had been exposed to not more than 2% of the required load cycles before it failed.
22. While the report does not quantify the effect of the trailer brakes on the failure of the draw-beam, it notes that even if the trailer brakes functioned properly, there would have been a lesser braking load transferred to the draw-beam. In Sandbox Consulting's opinion, the design was so far under the design requirements that it was difficult to imagine the impact of the trailer brakes would yield a significant effect.
23. The report also identified that the mounting bolts were inadequate in shoulder length and there was a lack of deburring on the inside face of the bolt-holes.
24. Sandbox Consulting concluded the draw-beam failed because of metal fatigue, under-design and faulty construction according to that design. While Mr Wastney's FEA had assisted in identifying a design

[3] Sandbox Consulting refers to Australian Standard 3990 (AS 3990) Appendix B, fatigue assessment requirements.

fault, overall the FEA undertaken for the certification work was substandard and did not meet good practice.

25. The report said the draw-beam was "significantly under designed and did not meet the requirements of NZS 5446:2007", and therefore should not have received certification.

MR WASTNEY'S RESPONSE

26. In an email to Engineering New Zealand dated Tuesday 26 March 2019, Mr Wastney acknowledged the draw-beam was deficient and under-designed. He said the under-design of the draw-beam was a one-off incident and not reflective of his usual design practice as an engineer. He was not able to say why he did not pick up the design flaws when running tests and certifying the draw-beam. He said in his 44 years as an engineer, this was the only failure he could recall.
27. Mr Wastney said he had paid the vehicle owner's cost of damages resulting from the accident.

PROVISIONAL DECISION

28. The Investigating Committee gave Mr Wastney an opportunity to comment on its provisional decision to refer the complaint to a disciplinary committee.
29. Waka Kotahi was also given an opportunity to comment on the Information Gathered section of the provisional decision.
30. In response, Waka Kotahi provided additional information, which is summarised under paragraphs 31 to 38. This additional information was also provided to Mr Wastney to comment on.

Physical inspection

31. Waka Kotahi provided information suggesting Mr Wastney did not complete an in-person physical inspection of the draw-beam before issuing the certificate. Waka Kotahi provided an email chain between himself and Mr Wastney, where Mr Wastney stated he was not in Greymouth on 15 June 2016, the day that the photos used in the certificate were taken.
32. Waka Kotahi also provided information stating HVSCs can delegate some aspects required of the certification process, but must complete a physical final inspection. These duties of HVSCs are found under section 2 and 9, and Table 2 of the Vehicle Inspection Requirements Manual (**VIRM**).
33. Waka Kotahi has also provided Mr Wastney's notice of appointment dated 26 August 2013, stating he owed these duties at the time he completed the certification.
34. Mr Wastney has not provided a response to this information.

One-off incident

35. The same email chain (provided by Waka Kotahi) shows Waka Kotahi asked Mr Wastney whether Mr Wastney issued certification to NSZ5446 for any other draw-beams that were the same or similar to the draw-beam in question. Mr Wastney said he had only used that design as a "one-off".
36. However, Waka Kotahi provided evidence suggesting that Mr Wastney had used the design in another project.[4] Waka Kotahi said the LT400 that Mr Wastney issued for the failed draw-beam was issued on 16 June 2016, some 25 months after the file was created. This raised further questions whether the

intention to certify the draw-beam was signalled two years before the certification was completed, and whether the drawing was used for another vehicle or vehicles prior to the June 2016 certification. Waka Kotahi asked Mr Wastney to check his records in case there were other vehicles that had draw-beams with the same or similar design as the one that failed, or else to provide an explanation.

37. Mr Wastney stated the CAD file for the design was created in 2014 but that he had not used the design at that time because he had concerns about it. He later offered it to a client who had asked for a compact design, and did not “look closely enough at the analysis at that time”. Mr Wastney said the design may have been used more than once and responded to Waka Kotahi that, “I can now see that your analysis is correct”.
38. Mr Wastney’s lawyer, who was engaged to represent Mr Wastney at the time the provisional decision was released, explained: “Mr Wastney's reference to 'one off' has its origins in the first questions put to him by Waka Kotahi in the context of asking how many other rigs were on the road with the same design. Mr Wastney understood NZTA's concern was for safety and the need to get any such rigs off the road, and in answering as he did he was endeavouring to assure Waka Kotahi there were no such other rigs on the road. In hindsight it can be acknowledged that the phrase was unfortunate but there was no intention to deceive."

DECISION

THE INVESTIGATING COMMITTEE’S ROLE

39. The Investigating Committee must determine if there are any applicable grounds for dismissal in Rule 57 of the CPEng Rules. If none of the grounds for dismissal apply, the complaint must be referred to a disciplinary committee. We can also consider if the complaint should be referred to alternative dispute resolution.
40. We have reviewed the initial information gathered, made and issued a provisional decision, received additional information and comments from the parties and considered that additional information provided to us.
41. Having reviewed and considered all documentation provided, we have decided the additional information received at the provisional decision stage does not materially change our decision and have therefore decided to refer the complaint to a disciplinary committee.
42. In our view, there are no grounds to dismiss the complaint. The reasons for this decision are set out below.

DISCUSSION

Reasons for draw-beam failure

43. The Sandbox Consulting report concluded that the draw-beam was under-designed to the degree that it was only able to deliver a very minor portion of the required fatigue design life before it failed.
44. Sandbox Consulting concluded that the draw-beam failed because of metal fatigue, under-design and construction according to that design. It also found the FEA completed by Mr Wastney was inadequate.
45. Mr Wastney has accepted the draw-beam was deficient and under-designed, and has not been able to explain how these errors may have occurred. He disagreed that the FEA model he employed was substandard.

Adequacy of Mr Wastney's analysis, design and certification of the completed draw-beam installation

46. Mr Wastney has accepted the design of the draw-beam was inadequate and he should not have certified that it met the requirements of the Standard.
47. Sandbox Consulting identified that the mounting bolts were inadequate in shoulder length and there was a lack of deburring on the inside face of the bolt-holes. These symptoms would not have been visible to Mr Wastney had he inspected the finished draw-beam.
48. However, an experienced engineer with forty-four years of engineering experience should have noticed, while assessing the load path analysis, that the beam had a load path that had not been appropriately accounted for. This is basic knowledge and we consider that Mr Wastney should have picked up on it and checked his calculations.
49. The separation of the truck and trailer, while travelling at speed on the open road, posed a serious public safety risk. Engineers undertaking the role of HVSC for Waka Kotahi have a responsibility to carefully check their work and complete an in-person final inspection of the draw-beam, as per the VIRM.[5] These duties correspond with an engineer's obligations, under the Code of Ethical Conduct, to safeguard health and safety, and to act competently.
50. Mr Wastney said he was not aware of any other errors in his engineering work. However, he has not been able to explain how he failed to notice the design flaws in this instance.
51. Mr Wastney has submitted that the under-designing of the draw-beam was not a reflection on his ability, but should be viewed as a "one-off" incident. Further email discussions between Waka Kotahi and Mr Wastney raised some uncertainty about whether Mr Wastney had used the same draw-beam design in another project or not. Mr Wastney's lawyer has accepted the use of "one-off" may have been "unfortunate". We are unable to make a factual finding, based on the information available, as to whether the design was used in other projects. However, we are concerned that Mr Wastney has not been able to explain the apparent contradiction in his responses to Waka Kotahi about whether the design had been used on other vehicles.
52. We note that Waka Kotahi revoked the certification of all draw-beams and draw-bars certified by Mr Wastney following the draw-beam incident, to mitigate the public safety risk. We strongly recommend Mr Wastney reviews any past work that is outside NZTA's jurisdiction, to the extent that it may pose any risk to public safety.

CONCLUSIONS

53. Considering all the information, it is our view that the draw-beam failed because Mr Wastney poorly executed multiple tasks regarding certification. Mr Wastney has acknowledged that the draw-beam design and analysis were inadequate and should not have been certified as meeting the requirements of the Standard.
54. An experienced engineer should have identified the load path in the draw-beam structure at the design stage and designed a structure to appropriately account for this.
55. While we have not made a finding whether Mr Wastney carried out a physical inspection of the draw-beam, we comment that a professional engineer in these circumstances should know and meet that requirement, and we would be significantly concerned if he had not carried one out.

[5] Refer to paragraph 29.

56. A high level of trust is placed in HVSCs by Waka Kotahi and the public to ensure heavy vehicles do not present undue risk on the roads.
57. We do not consider there are any grounds to dismiss the complaint under Rule 57 of the CPEng Act.
58. Accordingly, we refer the complaint to a disciplinary committee under Rule 60(a) of the CPEng Rules.
59. In our view, the matter for determination by the Disciplinary Committee is whether Mr Wastney acted negligently and/or incompetently when he designed and later certified the draw-beam, and whether he took appropriate steps to safeguard health and safety as required by the Code of Ethical Conduct.

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