



Project Orange industry report – Findings from the Heavy Vehicle Specialist Certifier Non- Compliance Review

Safer Vehicles, Regulatory Services (Te Roopu Waeture)

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This report is prepared for the Heavy Vehicle Specialist Certifier (HVSC) industry, to share the results and recommendations following the completion of Project Orange at the end of May 2021.

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Why the review began

In late 2018, a review of heavy vehicle specialist certifiers (HVSCs) began as a response to reports released following the Waka Kotahi regulatory failure. This was part of a programme of work reviewing the results of vehicle inspections and certifications across the country, as there was little visibility and understanding of how regulated groups were performing.

Following the discovery of several serious safety risks that led to a small number of HVSC suspensions, the review was also tasked to look at the actual work completed on vehicle components to ensure it matched certification details and vehicle safety was maintained.

The review was jointly setup by Waka Kotahi and the law firm Meredith Connell (which was managing the regulatory functions of Waka Kotahi in 2018 and into 2019) and was endorsed by the Waka Kotahi Board in 2018.

It became known as 'Project Orange', a link back to the 'medium/orange' risk category it was given when, in 2018, Meredith Connell highlighted 850 open compliance cases that were assigned a red/orange/green risk rating.

What the review was set up to achieve

The overall outcome of Project Orange was to gain a better understanding of how HVSCs were performing. Detailed objectives were:

- Completion of a review of a sample of HVSC cases selected from the regulatory non-compliance review
 - Gain a better understanding of whether any failings within the industry are likely to be an individual or a systemic issue
 - Gain insight into whether further investigation into a certifier or the industry may be needed
- Gain a better understanding of how certifier files represent the actual work done on vehicles
 - Physical inspection of any components flagged as a potential safety concern during the desktop file review
- Contribution to the development of processes and procedures to help us shape the regulation of heavy vehicle certification.

The approach taken

When Project Orange began, 44 certifiers were selected for review. Selection criteria included:

1. certifiers that hadn't been reviewed or had a poor review previously
2. certifiers where we had received complaints against them
3. a random selection of remaining certifiers to ensure a representative view of the industry.

A sample of files to review was selected from each of the 44 HVSCs.

Original approach

Results from the file reviews were going to be used to determine if there were certifiers requiring more in-depth review via vehicle inspections due to higher risk. Those found to have lower risk ratings would be managed through the standard regulatory review process.

Modified approach

As the file review progressed it became clear that lack of file information/record keeping in many cases made it difficult to assess the safety risk attached to certifications. This was particularly relevant for the project's second objective where lack of detail made comparison between the file and work completed difficult to determine.

The lack of information on some files also made it hard to determine the level of risk involved and this, supported by legal advice to apply a firm, fair and consistent method, meant that we had to change our approach. Instead of moving lower risk certifiers into the standard regulatory review process, all 44 certifiers remained under review in Project Orange.

Once all file reviews and vehicle inspections were completed for each certifier, the project team presented a recommendation to the Heavy Certification Review Panel (HCRP), comprising of internal and external engineers, legal advisers, and other key representatives from across Regulatory Services.

Also modified was the communications approach to ensure both the vehicle owner and issuing certifier were immediately told review results. This wasn't part of the initial setup of Project Orange and was quickly amended to ensure certifiers were emailed results following both the file reviews and vehicle inspections.

Note: the selection process for reviewing certifiers is available in Appendix A. Contract details for managing any conflict of interest is available in Appendix B. The full review process is documented in Appendix C.

Outcomes of the review

1. Completion of a review of a sample of cases selected from the regulatory non-compliance review

File review and inspection results are as follows:

- 469 vehicle component files reviewed
 - 213 passed file review (45%)
 - 22 removed from review (new certification/vehicle or component removed or destroyed)
 - 30 certifications revoked (6%)
 - 6 vehicles flagged in the system as needing to be checked at next CoF.
 - 198 flagged for vehicle inspection (42%)
- 198 vehicle inspections conducted
 - 121 passed inspection (61%)
 - 1 removed from inspection (component removed from vehicle)
 - 60 certifications revoked (30%)
 - 16 vehicles flagged in the system as needing to be checked at next CoF.

Certifier outcome (23% of industry reviewed)

- 20 (45%) had no safety concerns and no compliance actions taken
- 8 have retired or surrendered their appointment (2 after being served a Notice of Proposal to Revoke or Suspend)
- 4 were served a warning letter
- 9 were formally investigated (3 closed, 6 under active management and monitoring by the Director of Land Transport)
- 2 served Notice of Proposal to Revoke (both active and being managed by the Director of Land Transport)
- 1 served a Notice of Proposal to Suspend (currently active and being managed by the Director of Land Transport).

2. Gain a better understanding of how certifier files represent the actual work done on vehicles

The level of poor certification and record keeping in some cases confirms that Project Orange was necessary following an extended period of inadequate regulatory attention. We acknowledge that cleaning up historic poor regulatory and certification performance was a burden on both industry and teams within Waka Kotahi. However, minimising the risk to safety has been a top priority and it was critical that we understood the level of existing risk so it can be addressed.

Amongst the file reviews and inspections were some dangerously poor certifications that showed levels of incompetence for some certifiers. Given the size of the vehicles involved, this posed a significant risk to safety for all road users.

Project Orange reinforces that a different regulatory approach with the HVSC industry is required, including improvements in the levels of support and training received.

Reviewing certifiers commented that they were disappointed in some of the poor results found and, in some cases, they were shocked at the quality of work being produced by the industry.

Examples of poor quality certifications of vehicles reviewed within Project Orange:



3. Contribution to the development of processes and procedures to help us shape the regulation of heavy vehicle certification

Following the establishment of the Safer Vehicles team under the new Regulatory Services Group formed in 2019, the Heavy Vehicle Certification team was created.

This national team undertakes compliance monitoring of the HVSC industry as a business as usual regulatory function. All certifiers are to be reviewed within a three-year period and, where results determine a higher safety risk, some are visited as a priority and at an increased frequency. The Heavy Vehicle Certification team's goal is to work with industry to achieve safety on our roads and they will work with certifiers, where necessary and the certifiers willing, to help them reach and maintain compliance.

There have been many learnings for us following the conclusion of Project Orange, including understanding critical pain points for the industry. This has given us a greater understanding of the need to review the career pathway to increase capacity and capabilities.

We're working with Engineering NZ to identify where the 'wins' are, being mindful that there is high certification demand, a shortage of certifiers, and an aging demographic.

Priority work includes development of an exam syllabus for potential HVSCs so they are well prepared to sit their first exam, and improved training and ongoing development for current HVSCs.

We're looking at how we can improve the VIRM, including any potential Rule changes that may be required, and we're working with the HVSC industry and the Truck Trailer Manufacturers Federation (TTMF) on further changes.

In addition to ongoing work, we've also reflected on Project Orange itself and the lessons learned. We recognise that the original setup of the project and involvement of industry could have been done better. We hope never to undertake a review of this magnitude again, but we've captured our learnings as a source of information for Waka Kotahi.

Common themes identified as areas of focus

There were many common areas of failure identified from both the file reviews and vehicle inspections. A list of these can be found in Appendix D. We'll be reviewing work required across these areas as part of our ongoing work.

Health and wellbeing

We acknowledge this has been a difficult and stressful time for HVSCs, and for many of our own people who have been involved. This was always going to be the case when a regulatory spotlight was turned on to the industry and on ourselves.

The relationship between Waka Kotahi and the HVSC industry has suffered, particularly as there was little opportunity for certifiers to provide feedback throughout Project Orange. However, some decisions were made to ensure consistency was applied across decision making and processes, and a fair outcome for all was reached.

Our hope going forward is to rebuild trust by involving industry as much as possible. We have a number of new teams and people involved in heavy vehicle regulatory work and we want to move forward with a fresh perspective, focusing on improving the industry for all involved.

Conclusion of the review

We now have a much better understanding of this industry's performance, the impact on safety, and how to reduce that safety risk. We're also aware that we need to complete all remaining standard HVSC reviews to ensure risk levels are assessed.

The ongoing programme of work for the HVSC industry is designed to improve and support the industry.

The review highlighted that no one party can achieve success on its own. We have an opportunity to learn from the outcomes of Project Orange and work together to improve and support both the HVSC industry and safety on New Zealand roads.

Appendix A: Selection process for reviewing certifiers

Due to the lack of internal resource, we needed to source external technical advice. Non-HVSC engineers were considered unsuitable due to their lack of heavy vehicle expertise and the requirement to have files/work reviewed by engineers with the appropriate certification authority.

Consideration was given to sourcing overseas assistance, but was dismissed due to the differing overseas regulatory settings for the modification and certification of heavy vehicles.

This left the HVSC industry in New Zealand, which is small and stretched. When Project Orange was setup, we were aware that there were limits on expertise and resources (and were mindful that HVSCs also need to maintain their businesses to keep the industry moving). These circumstances raised obvious conflict of interest issues, which were managed from the start.

Throughout the project, the process has always required that the technical views of the HVSC reviewers be peer reviewed by our technical experts, and that all decisions about vehicles or HVSCs are made by Waka Kotahi delegates following decision-making processes.

Process for selecting HVSC reviewers

1. 'Manufacturing HVSCs' excluded – do not hold appropriate qualifications
2. HVSCs who don't hold appointments for main components excluded
3. HVSCs under review in Project Orange excluded
This left a list of around 50
4. We examined records for these 50– including review scores back to 2009 and history of complaints
5. HVSCs with a review score under 2.5 out of 3 excluded
6. HVSCs appointed after 2014 excluded (due to lack of experience)
This left 25 who were approached and 17 declined
7. Eight HVSCs were engaged for the first tranche of Project Orange
8. One HVSC removed himself from the reviewer list following further discussions with us
9. In mid-2020, a further round of appointments was made based on the same criteria
10. Another four HVSCs engaged for the completion of Project Orange.

Appendix B: Contract details for managing conflicts of interest

Contractual details

Professionalism, integrity

- 7 In providing the Services the Consultant shall exercise the degree of skill, care and diligence normally expected of a competent professional Heavy Vehicle Specialist Certifier (HVSC), including to the standards required of a HVSC pursuant to the applicable rules, legislation, and NZTA policies, and in accordance with any written or verbal instructions issued by the Client. The Consultant is required to have current HVSC authorisation for the duration of this Agreement. The Consultant shall exercise all due care, diligence and skill and shall conform with the highest standards reasonably expected of professional persons providing services of the type described in this Agreement.
- 8 The Consultant will act in a professional and courteous manner in performing the Services and dealing with the Client, its customers, employees and other Consultants.
- 9 The parties agree to act in good faith and demonstrate honesty, integrity, openness and accountability in their dealings with each other. and including in the provision of the services.

Confidentiality and intellectual property

- 10 The Client shall provide to the Consultant, free of cost, as soon as practicable following any request for information, all information in his or her power to obtain which may relate to the Services. The Consultant shall not, without the Client's prior consent, use information provided by the Client for purposes unrelated to the Services. In providing the information to the Consultant, the Client shall ensure compliance with the Copyright Act 1994 and shall identify any proprietary rights that any other person may have in any information provided.
- 11 The parties confirm they will safeguard all confidential information received under this contract, and will not use or disclose any confidential information beyond the extent necessary to perform the services under this agreement. The parties agree that confidential information is information that:
 - (a) is by its natural confidential, including but not limited to third party Intellectual Property or Confidential Information (including that belonging to other HVSCs), third party past review/audit scores of third parties (including in respect of other HVSCs), and any complaints that may have been made against third parties (including other HVSCs);
 - (b) any opinion or statement of fact expressed by the Client or any representative of the Client (including in relation to third parties / HVSCs) that is in any way related to Project Orange or the Client's work;
 - (c) is marked by either Party as 'confidential', 'in confidence', 'restricted' or 'commercial in confidence';
 - (d) is provided by either Party or a third party 'in confidence';
 - (e) either Party knows or ought to know is confidential.
- 12 The Consultant agrees to return or destroy any information provided by the Client, upon the request of the Client at the conclusion of the services provided by the Consultant for Project Orange, or upon termination of this agreement.

Conflicts of interest

- 13 The Consultant must tell the Client immediately if a conflict of interest arises. A conflict of interest will arise if the Consultant's personal or business interests do or could be conceived to conflict with its obligations under this agreement.
- 14 The Consultant is free to develop other business interests provided that these do not conflict with its obligations under this Agreement and that any potential conflict of interest is disclosed immediately to the Client.

Briefings

As well as the HVSC reviewers reading and signing the contracts, we provided briefings before reviewers commenced their engagement. The issue of conflicts of interest was discussed, including emphasis on real conflicts, as well as anything that could be conceived to be a conflict. We also emphasised that if any of the reviewers felt uncomfortable for any reason with a file assigned to them, they could reject it and we would reassign it.

Appendix C: Review process

Vehicles – file reviews

- Files selected by Waka Kotahi and sent to reviewers
- Reports submitted to Waka Kotahi
- Reports peer reviewed by Waka Kotahi technical team – often discussed with HVSC reviewer and the HVSC who issued the LT400 to get more information
- All decisions about vehicles made by Waka Kotahi delegates
 - Inspection required (Vehicles – inspections below)
 - No further action required
 - Safety letter
 - Revocation
 - Exemption
- HVSC notified of decision about vehicle.

Vehicles – inspections

- Files selected by Waka Kotahi and sent to reviewers
- Inspections organised by Waka Kotahi
- Reports submitted to Waka Kotahi
- Reports peer reviewed by Waka Kotahi technical team– often discussed with HVSC reviewer and the HVSC who issued the LT400 to get more info
- All decisions about vehicles made by Waka Kotahi delegates
 - Inspection required
 - No further action required
 - Safety letter
 - Revocation
 - Exemption
- HVSC notified of decision about vehicle.

Certifiers – regulatory outcome

- Waka Kotahi prepares file with Project Orange outcomes, review history, any other relevant material about the HVSC
- HCRP consists of Waka Kotahi management, both internal and external technical experts, and a legal adviser.
- External technical staff provide technical knowledge
- Recommendation by consensus
- Recommendation provided to Waka Kotahi management
- Decision made by Waka Kotahi delegate

Appendix D: Common areas of failure

Files:

- Untidy: sketches not readable, scan quality of documents
- Not logical: hard to follow, irrelevant information part of the certification particularly when multiple certifications are contained in a file
- Do not meet the minimum file content: summary only, no link to reference files, lacked fabricator instructions and adequate photos (before and after)
- Acceptance of non-compliant Statement of Design Compliance (SoDC) that does not comply with the VIRM
- LT400s containing incorrect VIN, category and standard certified to
- Using very old test data as evidence for certifications
- Poor work procedure: SoDCs issued after the LT400 or calculations after the issue
- As-built differs to the SoDC.

Welding:

- Welding clearly non-compliant with AS/NZS1554
- Welder not ticketed for the process and/or position
- Critical welds missing.

Materials:

- Material specifications not listed in the file
- Non-conservative assumptions made for material yield strength.

Spreadsheet calculators:

- Often contained errors and cells locked so could not be checked
- Incorrect units and conversion of numbers and decimal places
- Allowable stress levels above the standards limits.

Towing connections:

- Issues with calculating minimum coupling D value and stating this on the ID plate
- 20 degree fatigue requirement and how to calculate this
- Minimum information on ID plates not always compliant
- Residual life assessment not carried out correctly or at all
- No cumulative damage models used
- Not considering all loading conditions
- Failure to identify fatigue critical areas
- Drawbars, particularly longer types failing by buckling
- Not cleaning them up before inspection/final sign off eg back of drawbeams
- Couplings not always compliant or fit for purpose
- Mis-match of ratings, calculations at a lower value than the rating given, drawings not matching the calculator
- Jack-knifed drawbars not repaired to within a safe tolerance eg still residual side arm damage/not straight
- Fifth wheel installation not meeting NZS5450
- Towbars not meeting the 400,000km requirement.

Bolting

- Incorrect bolting calculations
- Multiple bolt sizes ignored and lowest selected
- Shank in shear assumptions but not conservative
- Bolt patterns not matching the as built/file
- Oversized holes/edge distance
- No bolting instructions supplied
- Overstressed bolts.

Chassis assessment, repairs and equipment fitment

- No root cause analysis for repairs
- No consideration of manufacturers' repair instructions
- All conditions of loading not checked
- Lack of evidence of weld procedures for chassis extensions, no driveline calculations or confirmation
- Overstressed tipper ram/hinge mounts
- Under-designed crane mounts/not fitted to manufacturer guidelines
- Accident damage not considering all components that could be affected.

Load Anchorage

- Deviations from NZS5444 standard details
- No assessment back to chassis structure
- Certifications not meeting the minimum per side/spacing or total capacity.

Brakes

- Non-compliant with schedule 5, in particular adhesion utilisation & braking ratio
- Non-brake rated valves used in the system
- Vehicle parked on the service brakes
- Components fitted and those in the calculator differed
- Section 6 not completed correctly
- No confirmation of friction material after modification
- Air supply taken from incorrect area eg trailer air supply from main air tank
- Incorrectly confirming compliance with original standard.