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November 6, 2025

Company name: Kanadevia Corporation

Representative: Michi Kuwahara, President & CEO

(Security Code: 7004; Prime Market, Tokyo Stock Exchange)

Inquiries: Toru Kawasaki, Executive Officer,

General Manager, Corporate Planning Department

Telephone: +81-6-6569-0005

(Progress of Disclosed Matters) Notice of Inappropriate Conduct at Our Mukaishima Works

Kanadevia Corporation hereby announces that today it submitted the “Interim Report” to the Ministry of Land, Infrastructure, Transport and Tourism, regarding the inappropriate conduct at our Mukaishima Works (hereafter “this matter”), which was previously announced in the “Inadequate Qualifications of Welding Operators in the Production of Bridges and Other Structures at Our Mukaishima Works” dated February 21, 2025 (replaced on February 27, 2025 and amended on March 4, 2025), and the “(Progress of Disclosed Matters) Notice of the Measures to Prevent Recurrence for Inappropriate Conduct in Businesses Other than the Marine Engine Business” dated April 30, 2025.

We deeply apologize for significantly undermining the trust of road users, road administrators, clients, and other stakeholders due to this matter, as well as for the considerable inconvenience and concern it has caused. Regarding this matter, we have determined, based on expert opinions and various verification results, that it does not have a significant impact on the safety of the products. Furthermore, for the bridges and other structures currently in use, we will conduct object inspections and follow-up monitoring in coordination with regular inspections, in consultation with road administrators.

We intend to implement further preventive measures based on the recurrence prevention measures announced in the “(Progress of Disclosed Matters) Notice of the Measures to Prevent Recurrence for Inappropriate Conduct in Businesses Other than the Marine Engine Business” dated April 30, 2025.

[Attached material]

November 6, 2025, Interim Report*

* The English version is an abridged translation of the original Japanese document disclosed on November 6, 2025.

End

(Abridged version)

Inappropriate Conduct in the Fabrication of Bridges and Other Structures at the Mukaishima Works

Interim Report

November 6, 2025

Kanadevia Corporation

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Introduction

In response to the inappropriate conduct in the marine engine business, which was disclosed in July 2024, Kanadevia Corporation (hereinafter referred to as “Kanadevia”) established a Special Investigation Committee composed of external experts and initiated a company-wide investigation. During the investigation, it was found that welding operators at Kanadevia’s Mukaishima Works involved in the fabrication of bridges and other structures lacked the proper qualifications. As a result, ahead of the announcement on February 21, 2025, a technical verification team, consisting of the countermeasure headquarters and engineers, was established to conduct verification and identify causes. In the final report from the Special Investigation Committee received on April 30, 2025, it was confirmed that in addition to the inadequate qualifications, multiple instances of inappropriate conduct had occurred for many years at the Mukaishima Works.

This report provides a detailed explanation of the seven cases in total of inappropriate conduct identified at the Mukaishima Works, including their specific nature, causes, impacts on the quality of structures, and future verification methods. In addition, this report outlines the key points of the advice received from experts in welding and steel structures as well as recurrence prevention measures developed based on said advice.

Kanadevia’s technical verification team conducts quality verification informed by advice and evaluation from external experts, while the Quality Assurance Unit at the head office, in collaboration with the technical verification team, handles root cause analysis and the development of effective recurrence prevention measures.

Kanadevia is taking this matter extremely seriously and is committed to clarifying the facts, reliably implementing recurrence prevention measures, and making company-wide efforts to restore trust.

I. Selection of Experts

1. Purpose of Expert Selection

It was found that personnel without the required welding qualifications were involved in welding work performed at Kanadevia's Mukaishima Works. This is a serious issue that undermines the safety and reliability of steel bridges and marine structures. Initially, objective and specialized evaluation needed to be carried out for technical verification of the relevant welded sections.

However, a subsequent investigation revealed that multiple cases of inappropriate conduct affecting the core of the quality assurance system (such as falsification of ultrasonic testing records, fabrication of coating thickness measurements, and unapproved changes in steel materials) had been occurring for many years.

It is extremely important to evaluate the impacts of all cases of inappropriate conduct on the quality and safety of structures from multiple perspectives and to ensure the objectivity and appropriateness of response measures.

To that end, external specialists in welding engineering, fracture mechanics, and steel structures were selected as experts. The experts provide rigorous "advice, verification, and evaluation" for all processes of Kanadevia's technical verification, root cause analysis, and recurrence prevention measures. The purpose of expert selection is thus to ensure the objectivity and reliability of the series of response measures and to fulfill Kanadevia's accountability to customers and society.

2. Composition of Experts

The following experts in their respective fields participated in the investigation.

- | | |
|--------------------------------|---|
| (1) Professor Satoru Asai – | Affiliation: Specially Appointed Professor, The University of Osaka
Specialty: Welding methods and welding process management |
| (2) Professor Mitsuru Ohata – | Affiliation: Professor, The University of Osaka
Specialty: Welding mechanics and fracture mechanics |
| (3) Professor Osamu Kiyomiya – | Affiliation: Coastal Development Institute of Technology, Professor Emeritus, Waseda University
Specialty: Marine structures and steel structures, including bridges |

II. Outline of the Inappropriate Conduct at the Mukaishima Works

1. Details of the Inappropriate Conduct

- (1) a. Execution of welding work by unqualified personnel
- (2) b. Falsification of repair records in ultrasonic testing
- (3) c. Inappropriate conduct regarding the timing of ultrasonic testing
- (4) d. Falsification of repair records in magnetic particle testing
- (5) e. Unauthorized substitution of steel materials during trial assembly inspections
- (6) f. Fabrication of coating thickness measurements for each coating stage (undercoat/intermediate coat)
- (7) g. Falsification of final coating thickness measurements

2. Outline of Each Case of Inappropriate Conduct

(1) a. Performance of welding by unqualified personnel

1) Outline of the incident

The Specifications for Highway Bridges, which are the technical standards for road structures specified in the Road Act, stipulate that welding work performed during the assembly of bridges “shall be carried out only by individuals who have passed tests corresponding to the type of intended welding work from among those specified in JIS Z 3801 or JIS Z 3841, or equivalent qualification examinations” (hereinafter referred to as “the JIS qualifications in question”). However, some of the welding work conducted at the Mukaishima Works involved personnel who did not possess the relevant JIS qualifications in question.

2) Period

a) Target period

① Period of inappropriate conduct: From August 1, 2013 to January 28, 2025

② Period subject to investigation: From August 1, 2013 to January 28, 2025

* ① Period of inappropriate conduct: The period during which the inappropriate conduct is believed to have occurred, based on follow-up interviews conducted by a lawyer acting as Kanadevia’s representative, following the completion of the investigation by the Special Investigation Committee.

* ② Period subject to investigation: The period during which an investigation to verify safety and soundness was available based on data and other records.

3) Target construction works

- a) Number of construction works carried out during the period of inappropriate conduct: 175 cases
- b) Number of construction works carried out during the period subject to investigation, for which data and other records are available: 175 cases

- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 173 cases

(2) b. Falsification of repair records in ultrasonic testing

1) Outline of the incident

In some construction works, welding defects that were initially judged as failures requiring repair by personnel from contracted inspection companies based on ultrasonic testing (UT inspection) and that later were judged to pass after repair were falsely recorded as having passed from the start in the repair records, and UT inspection reports were generated based on these falsified records.

Additionally, since around 2015, even though the reports created by the contracted inspection companies correctly recorded the history of repairs and re-inspections, the Quality Assurance Department at the Mukaishima Works falsified them to appear as if the defects had passed from the start. These falsified records were then attached to customer reports (UT customer reports) submitted to customers.

2) Period

a) Target period

- ① Period of inappropriate conduct: From around October 1997 at the latest to the end of January 2025
- ② Period subject to investigation: From 2010 to the end of January 2025

3) Target construction works

a) Number of construction works carried out during the period of inappropriate conduct

Since the specific construction works involving inappropriate conduct could not be identified, all construction works during the period were investigated. For construction works prior to 2010, no data remains; however, similar to the investigation period after 2010, repairs were carried out to ensure passing during re-inspections before shipping. Therefore, it has been determined that there are no quality issues.

b) Number of construction works carried out during the period subject to investigation, with data and other records: 236 cases

c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases

(3) c. Inappropriate conduct regarding the timing of ultrasonic testing

1) Outline of the incident

The “Inspection Procedure Manual” created by Kanadevia and submitted to customers stipulates that UT inspections should be conducted “at least 24 hours after the completion of welding.” However, in some cases, UT inspections were carried out before such 24-hour period had elapsed.

Although a 24-hour natural cooling period is required after repairing weld defects that failed UT inspections, there were cases in which UT inspections were carried out by blowing air onto

the UT inspection surfaces, approximately 200 mm away from the repaired sections, to lower the temperature to near ambient level allowing the UT inspection equipment to make contact.

2) Period

a) Target period

- ① Period of inappropriate conduct: From around 1980 at the latest to February 20, 2025
(It is difficult to identify the fabrication factories for construction works carried out between 1980 and 1986.)
- ② Period subject to investigation: From 2010 to February 20, 2025

3) Target construction works

a) Number of construction works carried out during the period of inappropriate conduct

Since the specific construction works where the inappropriate conduct occurred could not be identified, all construction works during the period were investigated. No data remains for construction works before 2010; however, given that the actions are similar in nature to those during the investigation period after 2010, and no quality issues were identified in those construction works, it was concluded that there were no quality issues in the construction works before 2010 as well.

- b) Number of construction works carried out during the period subject to investigation, with data and other records: 236 cases**
- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases**

(4) d. Falsification of inspection records (weld defect repair records) in magnetic particle testing

1) Outline of the incident

In the magnetic particle testing (hereinafter referred to as “MT inspection”) reports received from the contracted inspection companies, multiple inspection points were listed where weld defects were initially judged as failing but later judged as passing after repairs. However, in the MT inspection reports, some inspection points were falsely recorded as having passed from the beginning. These falsified records were then attached to the MT customer reports (which were submitted to customers after the Quality Assurance Department at the Mukaishima Works added a cover page to the MT inspection reports) and submitted to customers.

2) Period

- ① Period of inappropriate conduct: From around 2017 to the end of January 2025
- ② Period subject to investigation: From 2017 to the end of January 2025

3) Target construction works

- a) Number of construction works carried out during the period of inappropriate conduct: 25 cases**
- b) Number of construction works carried out during the period subject to investigation, with data and other records: 25 cases**
- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases**

(5) e. Unauthorized substitution of steel materials (splice plates) in trial assembly inspections

1) Outline of the incident

In internal inspections prior to customer-witnessed trial assembly inspections, if certain dimensions do not meet the allowable tolerances, the proper procedure is to either remake the splices using steel materials as specified by the customer for the assembly or consult with the customer to agree on a corrective plan. However, in some construction works, due to insufficient time to procure the steel materials specified by the customer before the trial assembly inspection, temporary splices were fabricated and temporarily assembled using materials different from those specified by the customer. These inspections were then falsified to appear as if they had been carried out using the steel materials specified in the customer's specifications.

2) Period

- ① Period of inappropriate conduct: From 2010 to 2023
- ② Period subject to investigation: From 2010 to 2023

3) Target construction works

- a) Number of construction works carried out during the period of inappropriate conduct: 181 cases
- b) Number of construction works carried out during the period subject to investigation, with data and other records: 181 cases
- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases

(6) f. Fabrication of coating thickness measurements for each coating stage (undercoat/intermediate coat)

1) Outline of the incident

In factory coating, when customers request coating thickness measurements (layer-by-layer management) for each layer (undercoat, intermediate coat, and topcoat), the thickness must be measured and recorded after completing each coating process.

However, due to a misunderstanding by the responsible personnel regarding the need for management and insufficient information sharing with subcontractor workers, there were cases in which coating was applied over layers that had not yet been measured, and the coating thickness of the lower layers was not recorded. In these cases, the responsible personnel falsified the inspection results by calculating fabricated values for the thicknesses of the intermediate coat and undercoat based on measurement results from other construction works, so that they appeared to be reasonable, and entered the falsified values into Excel files.

2) Period

- a) Target period
 - ① Period of inappropriate conduct: From around 2015 at the latest to the middle of January 2025
 - ② Period subject to investigation: From 2010 to the middle of January 2025 (the past 15 years)

3) Target construction works

- a) Number of construction works carried out during the period of inappropriate conduct: 207 cases

Since the specific construction works where the inappropriate conduct occurred could not be identified, all construction works during the period were investigated.

- b) Number of construction works carried out during the period subject to investigation, with data and other records: 185 cases
- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases

(7) g. Falsification of final coating thickness measurements

1) Outline of the incident

When the final coating thickness measurements taken after trial assembly did not meet the conditions requested by customers, the measurement values were falsified to make them appear as though the conditions were met, and the falsified values were submitted to the customers (by adding 10 to 30 μm to the actual coating thickness measurement values).

2) Period

- a) Target period

- ① Period of inappropriate conduct: From around 2015 at the latest to the middle of January 2025
- ② Period subject to investigation: From 2010 to the middle of January 2025 (the past 15 years)

3) Target construction works

- a) Number of construction works carried out during the period of inappropriate conduct: 207 cases

Since the specific construction works where the inappropriate conduct occurred could not be identified, all construction works during the period were investigated.

- b) Number of construction works carried out during the period subject to investigation, with data and other records: 199 cases
- c) Number of construction works, among those listed in b) above, for which available documentation could not confirm the absence of quality issues: 0 cases

3. Number of Construction Works Subject to Inspection Involving Inappropriate Conduct in the Fabrication of Bridges and Other Structures at the Mukaishima Works

Number of Construction Works Subject to Inspection Involving Inappropriate Conduct in the Fabrication of Bridges and Other Structures at Kanadevia's Mukaishima Works

Legend		a. Performance of welding by unqualified personnel	b. Falsification of repair records in ultrasonic testing	c. Inappropriate conduct regarding the timing of ultrasonic testing	d. Falsification of repair records in magnetic particle testing	e. Unauthorized substitution of steel materials in trial assembly inspections	f. Fabrication of coating thickness measurements for each coating stage (undercoat/intermediate coat)	g. Falsification of final coating thickness measurements
①	Number of construction works subject to inspection	175	236	236	25	181	207	207
②	Number of construction works for which no or only partial inspection records remained	0	0	0	0	0	22	8
③	Number of construction works confirmed to involve no inappropriate conduct	2	114	17	20	174	72	45
④	Number of construction works suspected to involve inappropriate conduct	173	122	219	5	7	113	154
⑤	Number of construction works for which available documentation could confirm the absence of quality issues	0	122	219	5	7	113	154
⑥	Number of construction works for which available documentation could not confirm the absence of quality issues	173	0	0	0	0	0	0

III. Impact of the Inappropriate Conduct on the Quality of Affected Structures and Quality Verification

1. Quality Verification of the Seven Specific Cases of Inappropriate Conduct

(1) a. Performance of welding by unqualified personnel

1) Key points of the incident

In the fabrication of bridges, marine structures, and chimneys, personnel without the welding qualifications specified in the Specifications for Highway Bridges and other specifications (the JIS qualifications in question) engaged in welding work.

2) Quality

The approach to ensuring quality in response to this incident is as follows.

a) Sections where there are no safety or soundness issues

① Sections with full-penetration welds

Non-destructive testing was performed along the entire length, and it was confirmed through records that the specifications were satisfied.

② Sections with automatic robotic welds

Qualified personnel operated the robots; no unqualified personnel were involved.

b) Sections requiring verification

- Sections with fillet welds in which unqualified personnel were involved: It is necessary to verify whether the quality of the welds involving unqualified personnel meets the specified quality standards through “on-site verification.”

c) Worker skills

- Unqualified personnel underwent verification of their welding experience and skill level upon entry, and it was confirmed that they possessed a certain level of competence.

3) Quality verification method

a) Verification of products under fabrication (uncoated)

The following on-site verification will be conducted of the uncoated product blocks currently at the Mukaishima Works.

① Inspector

- A third-party inspection company with no capital affiliation will carry out the inspection.

② Verification method

- Fillet welds that are believed to have been performed by unqualified personnel will be subjected to close-range visual inspection.
- Verification will be conducted on weld bead shape (e.g., unevenness, pits) and fillet weld size (dimensions and throat thickness).
- Verification will be conducted on the continuity of weld beads based on expert advice.

- Variation in weld bead shapes will be measured quantitatively using equipment such as “Wiki-Scan.”
(Expert recommendation)

③ Verification results

No significant differences were found between the areas presumed to have been welded by unqualified personnel and those welded by qualified personnel.
(Verified by experts)

b) Verification of products under fabrication (coated)

Since coating makes detailed visual inspection difficult, the following measures will be taken.

① Inspector

- A third-party inspection company with no capital affiliation will carry out the inspection.

② Verification method

- A close-range visual inspection will be conducted in the same manner as for uncoated products.
- To take into account the effects of coating, test pieces combining acceptable and unacceptable welds, both with and without coating, will be prepared and used as reference standards for comparison and evaluation of the actual welded areas.
(Expert recommendation)

③ Verification results

No significant differences were found between the areas welded by unqualified personnel and those welded by qualified personnel.
(Verified by experts)

c) Verification of construction works prior to handover

Although the details will be determined in consultation with the customer based on site conditions (e.g., presence or absence of scaffolding), the basic policy is as follows.

① Inspector

- A third-party inspection company with no capital affiliation will carry out the inspection.

② Verification method

- A visual inspection will be carried out, to the extent possible, along the entire length of the fillet welds presumed to have been performed by unqualified personnel.
- Test pieces will be prepared and used as reference standards for inspecting appearance in the same manner as products under fabrication (coated).
(Expert recommendation)

③ Verification results

No significant differences were found between the areas presumed to have been welded by unqualified personnel and those welded by qualified personnel.

④ Point of note

- Inspections involving the removal of existing sound coatings will be avoided as much as possible due to concerns that the recoated areas may experience reduced durability and diminished quality.

4) Conclusion

Objective and detailed visual inspections of appearance were carried out by a third-party inspection company with no capital affiliation on uncoated and coated products under fabrication, as well as at each stage prior to handover.

As a result, at each stage, no significant differences in appearance or shape were found between fillet welds performed by unqualified personnel and those performed by qualified personnel.

Based on this verification result, it was determined that the quality of the welded areas meets the required specifications, poses no issues for structure quality, and has no immediate impact on structural safety.

(2) b. Falsification of repair records in ultrasonic testing (UT inspection)

1) Key points of the incident

During the fabrication of bridges, marine structures, and chimneys, personnel from inspection companies or the Quality Assurance Department of the Mukaishima Works falsified repair records by altering them to show that weld defects—initially judged as failing and requiring repair based on UT inspection, and that later passed after repair—had passed from the beginning, and submitted these falsified records to customers.

The main cause of this inappropriate conduct was the concern that customers might doubt the weld quality if many defects were reported, which led to a scheme to underreport the number of defects in the reports.

2) Quality

Since all weld defects judged as failures related to the falsified UT repair records met the acceptance criteria during re-inspection after repair, there are no quality issues. (No attempts were observed to change defects recorded as “fail” in the acquired raw data to “pass” without performing repairs.)

As stated in the investigation report, regarding the repair records falsified by the inspection companies, there was no need for the inspection companies to falsify data for weld defects that were initially judged as failures by UT inspection and that later passed after repair. In fact, no such falsifications were found.

3) Quality verification method

Based on the above, it was determined that weld quality was not affected; however, re-verification of the non-destructive testing data was performed.

4) Verification results

Upon carefully reviewing the original UT repair records and the raw data from the inspection companies, it was confirmed that all areas initially judged as failures were properly repaired and met the acceptance criteria in re-inspections. Accordingly, it was determined that weld quality was not affected.

Additionally, it was determined that weld quality in construction works prior to 2010 was not affected either.

(3) c. Inappropriate conduct regarding the timing of ultrasonic testing (UT inspection)

1) Key points of the incident

Internal regulations stipulate that UT inspections for bridges, marine structures, and chimneys must be carried out at least 24 hours after the completion of welding. However, there were some cases where inspections were carried out before the specified waiting period in order to avoid schedule delays and to prioritize work efficiency.

Additionally, there were cases of inappropriate conduct in which welded areas that required a 24-hour natural cooling period after repair were inspected approximately one hour after welding by artificially lowering the temperature with air (blowing). According to the Specifications for Highway Bridges, inspections must be carried out “after an appropriate amount of time has elapsed since the completion of welding.”

2) Verification of impact on quality and verification results

To evaluate the impact of this incident on weld quality, verification was carried out through a literature review, analysis, and testing of specimens.

a) Background and theoretical considerations

In recent years, the use of low-Pcm steel has significantly reduced susceptibility to delayed cracking. The Japan Federation of Construction Contractors has stated that “inspection can be carried out once the welded areas have cooled to ambient temperature.”

b) Heat conduction analysis

Heat conduction analysis was conducted to evaluate the risk of delayed cracking. The results show that the cooling rate between 800 and 500°C, which affects the hardness and toughness of the heat-affected zone, is nearly the same whether air blowing is applied immediately after welding or natural cooling occurs. This indicates that air blowing does not adversely affect the microstructure or mechanical properties.

Additionally, the temperature of welded areas passes through the diffusible hydrogen emission peak (150–250°C), which is a cause of delayed cracking, within two to ten minutes following the completion of welding. The blowing in this case occurred after the peak (approximately one hour after welding), so the impact of blowing on quality is minimal. The cooling rate in this temperature range was also comparable to that of natural cooling.

Based on the foregoing, it can be concluded that blowing does not affect weld quality, and that inspection at ambient temperature is not problematic.

c) Physical verification using specimens

It was confirmed that specimens subjected to blowing immediately after welding did not exhibit any adverse impact with respect to weld quality.

In macro hardness testing, no structural abnormalities were observed, and the hardness of the heat-affected zone (HAZ) showed no significant variation. The value of approximately HV230 is below the upper hardness limit of HV350.

Furthermore, Charpy impact testing revealed that there are no adverse impact on toughness, and the test result was equal to or greater than the allowable value of 27 J for steel materials (SM490YB).

d) Conclusion

Based on the literature review, heat conduction analysis, and various test results, it was determined that the blowing and inspections conducted before the internal regulation's specified waiting period had elapsed did not have a significant impact on weld quality, such as the risk of delayed cracking or reduced toughness.

3) Expert opinions

The following expert opinion was obtained regarding the response measures and the series of verifications.

"The verification approach, which combines theoretical support through heat conduction analysis and confirmation of physical properties through various tests, is appropriate for the issue at hand. Based on these verification results, it can be concluded that the blowing and inspections conducted before the waiting period specified in the internal regulations had elapsed are highly unlikely to have a significant impact on weld quality (such as the risk of delayed cracking or reduced toughness)."

(4) d. Falsification of inspection records (weld defect repair records) in magnetic particle testing (MT inspection)

1) Key points of the incident

Although the MT inspection reports received from the inspection companies during the fabrication of bridges and marine structures noted that "multiple weld defects were repaired and passed in re-inspections," the reports submitted to customers were falsified to indicate that these welds had passed their initial inspections.

The main cause of this inappropriate conduct was, as with ultrasonic testing (UT inspection), an attempt to minimize the number of recorded defects in order to avoid giving customers concerns about the welding quality of the products.

2) Quality

All weld defects related to the falsification of MT repair records met the acceptance criteria in their re-inspections performed after repairs.

Reconfirmation of the raw data found no records where disqualified weld defects had been left unrepaired.

Based on the foregoing, it was concluded that there are no quality issues.

3) Quality verification method

Verification method: The original data in the MT (magnetic particle testing) inspection records was rechecked.

4) Verification result

Upon carefully reviewing the original MT inspection repair records and the raw data from the inspection companies, it was confirmed that all disqualified areas were properly repaired and

met the acceptance criteria in their re-inspections. Accordingly, it was concluded that there are no quality issues.

(5) e. Unauthorized substitution of steel materials (splice plates) in trial assembly inspections

1) Key points of the incident

During the fabrication of bridges, when certain dimensions failed to meet allowable tolerances in the internal inspections prior to the trial assembly inspection, and there was not enough time to procure the steel specified in the customer's specifications by the deadline, temporary splices made from steel materials different from those specified were fabricated and temporarily assembled without the customer's approval. The trial assembly inspection was then conducted in the presence of the customer.

2) Quality

As described in the investigation report, no temporary splices were delivered to customers. After the trial assembly inspection, new splices were fabricated using the steel materials specified in the customer's specifications, based on drawings that had passed the trial assembly inspection, and these were then delivered to the customer.

Based on the foregoing, it was concluded that there are no quality issues.

3) Quality verification method

Verification method: The materials in the factory were reviewed. Specifically, the construction documents (temporary splices and final splices) were cross-checked, and the mill certificates were verified.

4) Verification result

After cross-checking the construction documents and mill certificates of the steel materials, it was confirmed that the final products were fabricated with genuine materials in accordance with the customer's specifications and delivered accordingly. Based on this, it was concluded that there are no quality issues with the delivered products.

(6) f. Fabrication of coating thickness measurements for each coating stage (undercoat/intermediate coat)

1) Key points of the incident

In factory coating for bridges, specifications may stipulate the measurement and recording of the coating thickness of each layer of coating. However, due to misunderstandings and insufficient information sharing with subcontractors, there were instances in which subsequent processes were carried out before the coating thicknesses of the undercoat and of the intermediate coat could be measured, making such measurement impossible. In these cases, the responsible personnel falsified the coating thicknesses of the unmeasured layers by entering values based on the measurement results from other projects, ensuring the values appeared to be reasonable.

Since it was difficult to identify the specific construction works, quality verification was conducted for all works fabricated during the investigation period. The main cause of the issue was the missed measurement opportunities due to a misunderstanding by the responsible personnel and insufficient coordination with subcontractors.

2) Quality

The coating materials used in construction works are purchased for each coating layer (undercoat, intermediate coat, and topcoat) in quantities exceeding the design specifications for each construction work. Coating inspections and full can inspections (sometimes conducted with the customer in attendance) are then carried out. After completion of coating work, empty can inspections are conducted to verify that the required quantity of coating materials for each coating specification (undercoat, intermediate coat, and topcoat) has been used.

3) Quality verification method

Verification method: The quantities used were verified through full can and empty can inspection records. Additionally, the soundness of the coating films was verified by checking the final coating thickness in the coating records (coating thickness inspection). (For some construction works, photos related to the full and empty can records are missing.)

4) Verification results

Through the verification of the full can and empty can inspection records for the coating materials, as well as the final coating thickness measurement records, it was confirmed that the specified quantities of coating materials were used in each coating process and that the final coating thickness met the specified value. Therefore, it was determined that, despite the falsification, the overall soundness of the coating film has been maintained.

Progress observation: Progress observation will be conducted if the above verification concludes that the quality does not meet the required standards.

* Reference: According to the “Q&A for Steel Bridges: Life Cycle Cost Edition” by the Japan Bridge Association, the impact of insufficient undercoat coating thickness can be quantified as follows. For a C-5 coating, the expected service life is 60 years in a general environment and 30 years in a salt-damaged environment. Assuming a 30 μm deficiency in the undercoat epoxy paint, this would result in a 3.2-year reduction in service life under a general environment and a 1.7-year reduction under a salt-damaged environment.

(7) g. Falsification of final coating thickness measurements

1) Key points of the incident

During the coating thickness measurement after trial assembly in bridge fabrication, there were instances in which the measurement values were falsified by adding 10 to 30 μm when they did not meet the customer’s requirements, and the altered records were submitted to the customer.

The main cause of the issue was the prioritization of the fabrication schedule, which led to omission of necessary repair coatings when the measurement values were below the required values. Since it was difficult to identify the specific construction works through a hearing survey, quality verification was conducted for all works fabricated during the period.

2) Quality

In order to satisfy the required specifications, repair coating was performed on areas where the coating thickness was insufficient to meet the customer’s conditions.

3) Quality verification method

Verification method: The soundness of the coating film was confirmed by checking the final coating thickness in the coating records (coating thickness inspections) to ensure that all recorded values remained within the allowable range after subtracting 30 µm.

4) Verification results

It was confirmed that, even after subtracting 30 µm from the final coating thicknesses, the values remained within the allowable range. As a result, it was concluded that, although record falsification occurred, the products still met the required coating thicknesses. However, for some construction works carried out between 2010 and 2013, coating inspection records could not be found. For these cases, future actions, including on-site verification, will be discussed with customers.

2. Quality Verification of Bridges Before and After Being Put into Service, and of Installed Marine Structures and Chimneys

(1) a. Performance of welding by unqualified personnel

1) Evaluation of the effectiveness of the previously implemented verification methods

a) Among the quality verification methods (appearance inspection by third-party inspection companies, and comparison with test pieces used as reference standards) applied at each stage of the construction process—namely, during fabrication (uncoated), during fabrication (coated), and prior to handover—no significant differences were found between the areas welded by unqualified personnel and those welded by qualified personnel.

b) Evaluation by experts of the above result

The verification results, which showed no significant differences between the areas welded by unqualified personnel and those welded by qualified personnel, have been evaluated by experts as “the quality of the weld beads is good.” Furthermore, experts have given the opinion that this verification method can also be applied to bridges in service.

c) Future actions

Although experts assessed that “quality has been sufficiently ensured through verification during fabrication,” on-site verification will be conducted through regular inspections and other methods for structures involved in the falsification.

2) Implementation of on-site investigations for products in service

Regarding the implementation of on-site investigations, an effective and reasonable investigation method will be developed in consultation with each customer, based on the expert advice that it is practical to prioritize areas subject to regular inspections every five years.

These investigations will focus on appearance inspections of the weld areas involving unqualified personnel, checking for the continuity of weld beads and any cracking in the coating.

Any detected deformation will be promptly reported to the customer, and appropriate response measures will be discussed separately.

(2) The inappropriate conduct described in (b) through (g)

1) The inappropriate conduct described in (b) through (e)

a) Falsification of repair records in (b) ultrasonic testing and (d) magnetic particle testing

The original inspection data was carefully reviewed, and it was confirmed that any area that initially failed was repaired and subsequently passed the final acceptance criteria upon re-inspection.

b) (c) Inappropriate conduct regarding the timing of ultrasonic testing

Based on the heat conduction analysis and various tests, it was concluded that the inappropriate conduct is highly unlikely to have a significant impact on weld quality (such as the risk of delayed cracking and reduced toughness). Experts have also assessed this conclusion as reasonable.

c) (e) Unauthorized substitution of steel materials in trial assembly inspections

As described in the investigation report, no temporary splices were delivered to customers. After the trial assembly inspection, new splices were fabricated using the steel materials specified in the customer's specifications, based on drawings that had passed the trial assembly inspection, and these were then delivered to the customer.

It was concluded that the inappropriate conduct described in (b) to (e) does not adversely affect the quality of the final products, based on document reviews of inspection reports and other documents as well as verification tests. Therefore, on-site investigations of products in service are considered unnecessary.

2) The inappropriate conduct described in (f) and (g)

a) (f) and (g) Fabrication and falsification of coating thickness measurements

Based on the verification of coating usage records, full and empty can inspection records, and the final coating thickness after accounting for all falsifications, it was confirmed that the required coating quality has been ensured. However, in some cases, documents are missing.

Regarding the inappropriate conduct described in (f) and (g), in some cases, materials are missing, such as photos related to inspection reports and records of full and empty can inspections. Therefore, going forward, it is necessary to discuss with the respective customers the need for on-site investigations of products in service and appropriate methods of quality verification.

IV. Causes of the Inappropriate Conduct at the Mukaishima Works and Recurrence Prevention Measures

The following summarizes effective measures to prevent recurrence, based on an analysis of the root causes of the inappropriate conduct that persisted over an extended period at the Mukaishima Works, to ensure that similar issues do not recur.

1. Root causes of the inappropriate conduct

The inappropriate conduct at the Mukaishima Works was not the result of a single cause, but occurred and persisted due to a complex combination of factors, including the environment, organizational culture, management system, employee awareness, and skill transfer. The main causes can be broadly classified into the following four categories.

(1) Issues in the management system and its operation that facilitated the inappropriate conduct

- 1) The management system allowed inspection data to be falsified after the fact.
- 2) There were no internal regulations mandating the storage of raw inspection data. As a result, it became standard practice to discard the raw data after completion inspections, making post-verification impossible.

(2) Lack of compliance awareness and erosion of established norms

- 1) A complacent attitude that considered it acceptable as long as there were no serious issues with quality or safety had become widespread. This led to a lack of basic awareness of the need to comply with standards and agreements with customers.
- 2) The importance of compliance had not been fully instilled in each employee, and headquarters-led training had failed to bring about a change in awareness at the site level.

(3) Organizational dysfunction

- 1) The Quality Assurance Department, which was supposed to oversee the manufacturing department, failed to fulfill its role, with responsible personnel in the department themselves becoming involved in the inappropriate conduct.
- 2) Personnel exchange with headquarters was limited, leading to a closed organizational culture and an inward-facing sense of camaraderie unique to the works, which became obstacles to correcting the inappropriate conduct.

(4) Issues related to technology and human resources

- 1) The overall skill level of the works decreased due to the difficulty of securing replacement personnel after the mass retirement of experienced, skilled employees.
- 2) The failure to transfer skills and knowledge contributed to the involvement of unqualified personnel and the falsification of inspections.

2. Basic Policy and Overall Approach to Prevent Recurrence

The root cause of the inappropriate conduct was the “normalization of deviation,” where minor deviations that occurred repeatedly were tolerated on-site without supervision or correction. To address this issue, the following comprehensive recurrence prevention measures, which include not only technical solutions but also the reform of organizational culture, will be thoroughly implemented.

(1) Reform of organizational culture

- 1) Messaging from management: Executives will repeatedly communicate the importance of strict compliance through all available channels to instill a company-wide awareness that inappropriate conduct will not be tolerated.
- 2) Interactive explanatory meetings: Meetings to explain the investigation results were held at eight locations nationwide for all officers and employees.

Management will directly explain the investigation results and gather feedback from on-site personnel, providing an opportunity for all officers and employees to reconsider the issues posed by the inappropriate conduct as their own responsibility.

(2) Strengthening the quality assurance organization and supervisory system

- 1) Strengthening the independence of the quality assurance organization: In October 2024, the Quality Assurance Unit was newly established under the direct supervision of the president by consolidating the previously dispersed Quality Assurance Departments. This move enhances its independence from the manufacturing department and strengthens its oversight functions.
- 2) Establishment of the Quality Compliance Committee: A company-wide committee was newly established to conduct risk assessments four times a year. This committee verifies document traceability and cross-checks raw data against reports to detect and correct inappropriate conduct at an early stage.

(3) Bridging the gap between knowledge and practice (restructuring of education)

- 1) Development of guidelines and educational reform: The Guidelines on the Prevention of Quality Fraud will be established by March 2026. In addition to the existing e-learning system, a new e-learning program specifically focused on the risks of quality fraud will be introduced. Practical, interactive compliance training will be conducted regularly.

(4) Reliable implementation of effective recurrence prevention measures

- 1) Third-party audits: For the time being, strict audits, including quality patrols and inspection witnessing, will be conducted with the assistance of a third-party organization under a resident management system, thereby ensuring the effectiveness of the recurrence prevention measures.

(5) Reacquisition of ISO 9001 certification and transition of the audit system

- 1) To demonstrate external reliability by fully integrating the recurrence prevention measures into the quality management system, ISO 9001 certification will be re-acquired. After reacquisition, the system will transition to a permanent internal audit system led primarily by the Quality Assurance Unit, thereby establishing an autonomous quality improvement cycle.

3. Recurrence prevention measures for individual incidents

The following specific recurrence prevention measures will be thoroughly implemented for the seven specific cases of inappropriate conduct.

(1) [a] Welding work by unqualified personnel

- 1) Strict qualification management: Contracts with subcontractors will require welding work to be performed by qualified personnel, and the qualification certificates (copies) of both internal and external personnel will be centrally managed by the production technology department.
- 2) Pre- and post-work verification: Qualifications will be checked during pre-work meetings before assigning tasks, and supervisors will rigorously verify work upon completion.
- 3) Strengthening the monitoring system: Qualified personnel will be identifiable by helmet color or other means, and patrols by managers will be reinforced.
- 4) Confirmation after welding work: After each welding process and before proceeding to the next process, supervisors will verify the “qualification certificates” and “quality management sheets” to confirm that the work has been performed by qualified personnel.

(2) [b and d] Falsification of inspection reports (ultrasonic testing and magnetic particle testing)

- 1) Reports from inspection companies shall be submitted in a non-editable format (e.g., PDF), and strict control shall be maintained to ensure proper storage of raw data.
- 2) The Quality Assurance Unit shall not make any changes to the received reports and shall attach them to the reports submitted to customers.

(3) [c] Inappropriate conduct regarding the timing of ultrasonic testing

- 1) Strict compliance with rules: The requirement of a “waiting period of at least 24 hours” after the completion of welding shall be strictly observed, and this requirement shall be thoroughly confirmed during pre-work meetings.
- 2) Recording and confirmation of elapsed time: The formats of the inspection application form and related documents shall be revised to record the welding completion time and the inspection start time, and inspections shall be permitted only after managers have confirmed that the required amount of time has elapsed.

(4) [e] Unauthorized substitution of steel materials in trial assembly inspections

- 1) Establishing rules for customer consultation: When it becomes necessary to use components not included in the original plan or design due to dimensional defects or other reasons, consultation with the customer and the main contractor shall be mandatory in all cases, and formal approval must be obtained.
- 2) Thorough verification: During trial assembly inspections, cross-checking between the mill certificates of the steel materials used and the construction plan documents shall be strictly enforced, and the use of steel materials not specified in the plan shall be strictly prohibited.

(5) [f and g] Fabrication and falsification of inspection records (coating thickness measurements)

- 1) Measuring, recording, and confirming the coating thickness at each coating stage (undercoat and intermediate coat) shall be required before proceeding to the next process.
- 2) A system shall be implemented to automatically import measurement data, maintain the edit history, and save the data in a non-editable format.
- 3) A sampling-based double-checking system shall be implemented to ensure the accuracy of records.

Conclusion

The inappropriate conduct that occurred over many years at our Mukaishima Works revealed through this investigation is absolutely unacceptable for a company entrusted with social infrastructure. We sincerely apologize for having significantly undermined the trust of our customers and society.

The investigation revealed that the inappropriate conduct, including work by unqualified personnel and falsification of records, was not isolated deviant behavior by a few employees but rather reflected structural problems pervasive throughout the works.

The root causes of these problems lie in a culture that prioritized delivery dates and costs while disregarding legal compliance, in the Quality Assurance Department's involvement in improper conduct without fulfilling its oversight functions, and in the factory's closed organizational culture that resulted from insufficient supervision by the headquarters.

Kanadevia is taking the results of this investigation extremely seriously and will implement, with resolute determination, the recurrence prevention measures outlined in this report. These measures are initiatives aimed at fundamental organizational reform, which include not only revising systems but establishing a framework that does not tolerate inappropriate conduct and through raising employee awareness.

Restoring the trust lost will not be easy; however, we pledge that everyone in the company will work together to effectively promote recurrence prevention and will make continuous efforts to become a trusted company. Our greatest responsibility is to overcome the past issues at the Mukaishima Works and to transform it into a factory that takes pride in providing the highest quality and compliance.