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* **IN THE HIGH COURT OF DELHI AT NEW DELHI**

% *Date of Decision: 29th May, 2026*

\+ C.A.(COMM.IPD-PAT) 84/2024

THE NIPPON SIGNAL CO., LTD. .....Appellant

Through: Ms. Kanu Priya, Mr. Saransh Vijayvargiya and Mr. Daksh Oberoi, Advocates.

versus

ASSISTANT CONTROLLER OF PATENTS AND DESIGNS .....Respondent

Through: Ms. Nidhi Raman, CGSC with Mr. Om Ram and Ms. Nikita Singh, Advocates.

CORAM:
HON'BLE MS. JUSTICE JYOTI SINGH

JUDGEMENT

JYOTI SINGH, J.

1. This appeal is filed on behalf of the Appellant under Section 117A of the Patents Act, 1970 ('1970 Act') laying a challenge to order dated 18.07.2024 passed by the Respondent under Section 15 refusing grant of Patent in Indian Patent Application No. 201617036284 as also for a direction to the Respondent to grant the patent for the claimed invention on the revised claims.

2. To the extent necessary, case set up in the appeal is that the Appellant, which is a Japanese company filed a patent application in India bearing No.201617036284 on 24.10.2016 based on PCT application No.PCT/JP2015/059970 dated 30.03.2015 in respect of invention titled *"REDUNDANT CONTROL DEVICE AND SYSTEM SWITCHING METHOD"*. Request for Examination was made on 12.03.2018 and First Examination Report ('FER') was issued on 11.02.2021 by the Patent Office,

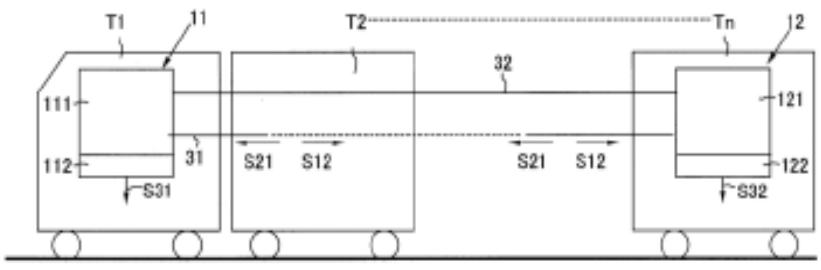
response to which was filed by the Appellant on 25.06.2021. Hearing was conducted on 02.02.2024, whereafter Appellant filed post-hearing written submissions with revised claims on 15.02.2024. By impugned order dated 18.07.2024, Respondent refused the application and the order was received by the Appellant on 18.07.2024.

3. As stated, present invention relates to a redundant control device including an active system and a standby system and a method for switching systems therefor. The object of the claimed invention is to provide a low-cost redundant control device that does not distinguish a main system from a subordinate system and thereby shortens the system switchover period and a method for switching systems therefor. To achieve this object, the invention provides a redundant control device including an active system and a standby system, both of which operate in sync with each other, which means that when the active system detects an error, the information is sent to the standby system to disable output control data of the active system and switch to output control data of the standby system. This avoids discontinuity in output control data, which may possibly occur with the system switchover. Thus, the active and standby systems have a coordinated relationship not a master-subordinate relationship.

4. It is stated that prior to the switchover to the output control data of the standby system, the standby system receives the error detection information from the active system so that the latter can be smoothly switched to the standby system. Unlike the conventional techniques, neither the function nor the circuit configuration is required for comparing the calculation result from the active and standby systems and this shortens the system switchover period and saves cost. Additionally, the system switchover is carried out depending on whether the active system detects an error without any

processing for comparing calculation result from the active and standby systems by using mirror memory. Even if both systems are installed apart from each other, layout can be easily realized and there is no necessity to dispose the two systems close to each other and moreover, a relay for switching the active to the standby system can be omitted, which shortens a system switchover period and saves cost. Specifically, the present invention is applicable to a train control, in which case the active and standby systems are installed separately in the front and last cars of the train. According to this installation, two dual on-board controllers i.e., a dual on-board controller mounted on the first car and a dual on-board controller mounted on the last car can be reduced by half i.e., a single dual on-board controller composed of an active system mounted on the first car and the standby system mounted on the last car, which results in remarkable reduction of the cost. Therefore, by this invention it is possible to provide a low-cost redundant control device that does not distinguish a main system from a subordinate system to shorten a switchover period and a method for switching systems. Diagrammatically represented Figure 2, which illustrates an example of the redundant control device applied to a train controller is as follows:-

Figure 2



5. It is stated that the synchronized active system and the standby system

include the available existing hardware such as CPUs serving as a control unit and a synchronous circuit for driving the CPUs in sync with each other and both systems mutually transmit/receive information by serial transmission. Working of the invention is explained that the output control data of the active system or output control data of the standby system are input to a controlled device by use of an external interface unit and an output control data line. When the active system detects an error, information is sent to the standby system to disable the output control data of the active system and switch to output control data of standby system and prior to the switchover the standby system receives the error detection information and hence, the active system can be smoothly switched off to the standby system. In a general operating condition, the output control data of the active system is sent to the controlled device via the output control data line and although, the output control data of the standby system is disabled similar to the active system, the standby system receives information from the control device and operates equivalent to the active system to prepare for the error. When the active system operates normally, its cycle should be correct and a periodic timer of the standby system is adjusted to that of the active system via the synchronous line. When the active system next detects an error, the information is sent to the standby system from the active system. At the time when systems are switched in the next cycle, the output control data of the active system is disabled and switched to the output control data of the standby system. Both systems work in syc with each other, whereby it is possible to avoid discontinuity between the output control data and synchronous line, which may possibly occur with the system switchover. Unlike conventional configurations, neither the functions nor the circuit configurations is required for comparing calculations results from the active

and standby systems and this contributes to reduction in system switchover period as well as cost. After the output control data of the active system is disabled and switched to one of the standby system, if the active system still detects an error, the active system is stopped. The pending claims 1-5 are as follows:-

> *"**We claim:***
>
> *1. A redundant control device used for a train controller in which an active system (11) and a standby system (12) that are separately disposed in a front car (T1) and a last car (Tn) among train cars (T1, T2, ..., and Tn), the active system (11) and the standby system (12) being connected via lines (31, 32) and transmitting and receiving information by serial transmission, the redundant control device being a low cost device that does not distinguish a main system from a subordinate system, to thereby shorten a system switchover period,*
>
> ***characterized in that**:*
>
> *the active system (11) and the standby system (12) operate in sync with each other, and*
>
> *if the active system (11) detects an error, the active system (11) sends error detection information (S12) to the standby system (12), and then, output control data (S31) of the active system (11) is disabled and is switched to output control data (S32) of the standby system (12), and*
>
> *if the active system (11) still detects an error, the active system (11) is confirmed as having failed, and is stopped.*
>
> *2. The redundant control device as claimed in claim 1, wherein after the output control data (S32) of the standby system (12) is used, if the active system (11) detects no error, the output control data (S31) of the active system (11) is used.*
>
> *3. The redundant control device as claimed in claim 1, wherein the active system (11) and the standby system (12) include a CPU (111, 121) and an interface unit (112, 122), and supply output control data (S32) from the interface unit (112, 122) to a controlled device (5) via an output control data line (33).*
>
> *4. A method for switching systems for a redundant control device used for a train controller in which an active system (11) and a standby system (12) that are separately disposed in a front car (T1) and a last car (Tn) among train cars (T1, T2, ..., and Tn), the active system (11) and the standby system (12) being connected via lines (31, 32) and transmitting and receiving information by serial transmission, the redundant control*

device being low cost device that does not distinguish a main system from a subordinate system to thereby shorten a system switchover period, comprising the steps of:

synchronizing the active system (11) and the standby system (12) in sync with each other;

sending from the active system (11), if the active system (11) detects an error, error detection information (S12) to the standby system (12);

disabling output control data (S31) of the active system (11) and switching to output control data (S32) of the standby system (12); and

stopping the active system (11) itself if the active system (11) still detects an error at a next cycle.

5. The method for switching systems as claimed in claim 4, wherein at the next cycle after the step in which the output control data (S31) of the active system (11) is disabled and switched to the output control data (S32) of the standby system (12), if the active system (11) detects no error, further comprising the step of disabling the output control data (S32) of the standby system (12) and switching to the output control data (S31) of the active system (11).”

6. It is stated that after the application was examined under Sections 12 and 13 of 1970 Act, FER was issued on 11.02.2021 raising objections of lack of novelty, lack of inventive step under Section 2(1)(ja), non-patentability under Section 3(k), insufficiency of disclosure and lack of clarity and conciseness. Appellant sent two replies to the FER dated 25.06.2021 pointing out at the outset that it had amended the claims to remedy the objections in accordance with provisions of Section 57(6) *albeit* the same may not be treated as acquiescence to the objections and the amendment was made only to expedite prosecution of the application. Amended set of claims 1-5 were submitted with the reply and independent claim 1 was revised by incorporating features of claims 3, 5 and 6. Original claims 3-6 and 10 were deleted and dependent claims were suitably revised to replace the dependency clause. Amended set of claims were prefaced with the opening clause ‘*We Claim’*. Detailed submissions were made contesting the objections. After considering the reply, hearing notice was sent wherein

objections pertaining to lack of inventive step and non-patentability were shown as outstanding. After oral hearing, post-hearing written submissions were filed by the Appellant, however, by the impugned order the application was refused by the Respondent on lack of inventive step under Section 2(1)(ja), owing to cited prior arts D1 and D2. Relevant part of the impugned order is as follows:-

> *"**7.** Now, I turn my attention to the claimed subject matter. The subject matter as described and claimed relates to redundant control device for a train controller features an active system and a standby system, positioned separately in the front car (T1) and the last car (Tn) of the train. These systems are interconnected via lines and communicate using serial transmission. This cost-effective device does not differentiate between a main and a subordinate system, thereby reducing the system switchover time. The active and standby systems operate in synchronization. If the active system detects an error, it sends error detection information to the standby system. Subsequently, the active system disables its output control data, switching to the output control data of the standby system. If the error persists, the active system is confirmed to have failed and is stopped.*
>
> ***8.** With regard to the substantive objection under the header "invention u/s 2(1)(j)" of the said Hearing notice, the applicant has submitted that "…The Applicant submits that the characterized features in independent claim 1 are neither explicitly nor implicitly taught in any cited prior art documents. Particularly, the aboveunderlined features of claim 1 are not disclosed in any of the cited documents, considered alone…*
>
> > *… The cited prior art D1 discloses a duplexed system for an operation processor, but it does not specify that it relates to trains…*
> >
> > *… advantageous effects are disclosed in para [0038] and [0039] of the description. In particular, the two dual on-board controllers, i.e. the dual on-board controller mounted on the front car T1 and the dual onboard controller mounted on the last car Tn as in the conventional configuration, can be reduced by half, i.e. a single dual on-board controller composed of the active system 11 mounted on the first car T1 and the standby system 12 mounted on the last car Tn. As a result, the cost can be considerably saved. In addition, a period for switching the active system 11 to the standby system 12 can be shortened and thus, a signal transmission time consumed by the switchover can be saved. It is accordingly possible to execute precise train control; for example, a train interval can be reduced to enhance the operational efficiency or the like…*

... the present invention according to claim 1 involves a technical advance as compared to the prior arts and having economic significance, i.e. the cost can be considerably saved. In addition, a period for switching the active system to the standby system can be shortened and thus, a signal transmission time consumed by the switchover can be saved. Further, it is accordingly possible to execute precise train control; for example, a train interval can be reduced to enhance the operational efficiency or the like…

... None of the cited documents, D1-D2, either alone or in combination disclose or even hint a solution according to the independent claim 1 of the present invention…

9. *Regarding the above submission, it is noted that, in F. Hoffmann-La Roche Ltd vs Cipla Ltd case (2012), the Hon'ble Delhi High Court had observed that the obviousness test is what is laid down in Biswanath Prasad Radhey Shyam vs Hindustan Metal Industries Ltd (AIR 1982 SC 1444), and stated that "....normal and grammatical meaning of the said person who is skilled in art would presuppose that the said person would have the knowledge and the skill in the said field of art and will not be unknown to a particular field of art and it is from that angle one has to see that if the said document which is prior patent if placed in the hands of the said person skilled in art whether he will be able to work upon the same in the workshop and achieve the desired result leading to patent which is under challenge. If the answer comes in affirmative, then certainly the said invention under challenge is anticipated by the prior art or in other words, obvious to the person skilled in art as a mere workshop result and otherwise it is not…"*

10. *In the view of the above, it is understood that the person skilled in the art is a competent craftsman or engineer as distinguished from a mere artisan. Hence, in the instant application, the person skilled in the art is a normal technical engineer. In the instant application, the person skilled in the art would be a person who has knowledge about the disclosure of D1, D2 and foundational knowledge on which the disclosure of D1 and D2 is based.*

11. *Without prejudice to the submission of the agent, D1 is the closest prior art, which discloses Regarding claim 1, a duplexed operation processor control system includes CPU1 and CPU2 which are identical and having a communication path for communication between them, data to be snooped by a CPU2 of the subordinate system as a stand-by system from a CPU1 of the main system as an execution system are set as control information from a control target to be acquired by the CPU of the main system. D1 discloses that Primary CPU **1** actually sends a control command to the control target, the secondary CPU **2** does not control the control target and is in a stand-by state ready to be switched over when a trouble occurs in the primary CPU **1** (refer paragraph[0011], [0018]-[0059], figure 1). D1 provides a dual control system, the slave system*

CPU as a standby system is configured to Snoop data from the master system CPU as an execution system and control information retrieved from the control object by the master system CPU.

Applicant submitted that Claim 1 differs from Cited Document D1 & D2

"the active system (11) and the standby system (12) operate in sync with each other, and if the active system (11) detects an error, the active system (11) sends error detection information (S12) to the standby system (12), and then, output control data (S31) of the active system (11) is disabled and is switched to output control data (S32) of the standby system (12), and if the active system (11) still detects an error, the active system (11) is confirmed as having failed, and is stopped."

However D1 discloses regarding claim 1 the active system (11) and the standby system (12) operate in sync with each other, and if the active system (11) detects an error, the active system (11) sends error detection information (S12) to the standby system (12), and then, output control data (S31) of the active system (11) is disabled and is switched to output control data (S32) of the standby system (12)(refer paragraphs[0023], [0029]- [0046], figure 1), and if the active system (11) still detects an error, the active system (11) is confirmed as having failed, and is stopped (implicitly disclosed by D1, refer figure 5 and paragraphs [0061]-[0065] and D2).

*D1 discloses (refer paragraphs [0061]-[0065]) that "how to perform the primary/secondary CPU switch-over process in another condition. In this condition, the secondary CPU does not consecutively confirm arrivals of snooping request-related frames to be sent from the primary CPU if in a normal state. In the control cycle time, if the secondary CPU **2** cannot confirm several consecutive times arrival of the snoop request frame, the snooping result request frame and the healthy status frame that are to be periodically sent from the primary CPU **1** when the CPU **1** normally operates, the secondary CPU **2** determines that the primary CPU **1** is currently in trouble. Note that this trouble may be checked by using a time-out detection preconfigured in the communication paths **5** and **6**. At this time, the secondary CPU **2** switches over to the primary by itself, acquires the authority to use the communication path **5** and outputs the CPU switch-over request frame to the I/O **3** . When receiving the CPU switch-over request frame **51**, the I/O **3** sends the CPU switch-over acknowledge frame to the CPU **2** via the communication path **5** , and then the CPU **2** switches over to the primary by itself starts to control the system. Thereafter, the CPU **1** that has been detected to be currently in trouble will not be switched over to the primary."*

Therefore it is disclosed by D1 that when an error· is detected by the system, a failure of the system is determined, and only the standby system performs operation control. As such, those skilled in the art will readily recognize that when the system fails, the system's action is halted is thus

evident for a person skilled in the art in combination with common general knowledge in the art and D1.

Moreover D2 discloses regarding dual system where on-board controller which generates position information is transmitted to the ground control device via a standby dual system, in a train control system being a dual system. The input of the received data from the ground control device and the train control based on the input are performed via a parallel dual system. When a main system causes failure, the location information of a slave system is informed to the ground control device by switching the connection with an on-train radio set from the main system to the slave system by a switching mechanism. Moreover D2 discloses that on-board controller issues a command to stop the train when an error between the position information and the position information received from the ground control device is out of an allowable range.

Therefore, at the time of the alleged invention, it would have been obvious to a person skilled in the art to arrive at the said claimed features of the instant alleged invention in the light of D1, D2 and common general knowledge. Further, the subject matter of the alleged invention would have been obvious in the course of normal research, experimentation and trial & error. Hence, the claimed subject matter of the independent claim 1 is obvious and lacks inventive step under section 2(1)(ja) of the Patents Act, 1970 (as amended).

Without prejudice, the claimed subject matter of the dependent claims 2 to 5 falls within the scope of the independent claim. Since the independent claims are found to involve no inventive step over the cited art as detailed in the preceding paragraph, the claimed subject matter of their subsequent dependent claims is also rendered obvious and not inventive mutatis mutandis.

Therefore, in view of the aforesaid, it is concluded that the subject matter of claims 1 through 5 in this instant application lacks inventive step. As such, the substantive objection under the header "invention u/s 2(1)(j)" of the said Hearing notice still holds good. Therefore, the claimed subject does not constitute an 'Invention' as defined under section 2(1)(j) of The Patents Act, 1970 (as amended).

Now, looking at the statutory provisions, the definition of invention is given in the section 2(1)(j)- "invention" means a new product or process involving an inventive step and capable of industrial application;

The section 2(1)(ja) defines inventive step- "inventive step" means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art;

The last part of the definition says- that makes the invention not obvious to a person skilled in the art. This part is added with the earlier part with the

conjunction 'and', which makes the last part a mandatory condition to be fulfilled.

Now, it has been evident now that if D1 and D2 are combined with common general knowledge, the feature as contested by the agents of the applicant does not become notobvious to a person skilled in the art. In the absence of this mandatory condition, the instant application cannot be said to involve an 'inventive step'. Consequently, it is not an 'invention' within the meaning of 'the' Act.

Hence, in view of the aforementioned facts, the objections as regards not involving an 'inventive step' being raised from the stage of First Examination Report (F.E.R.) persist.

***12.** It is noted that the oral argument and the written submission of the agent of the applicant have been carefully considered. However without prejudice, although the hearing submissions have attempted to address the other requirements, yet the substantive requirement of the Patents Act, 1970 i.e. Section 2(1)(ja) is not found complied with. Hence, in view of the above and unmet requirements, this instant application is not found in order for grant.*

***13.** Therefore, keeping in view the above facts, the submissions of the agents during hearing and subsequently through the written submission, as well as the outstanding official requirements, instant application no. 201617036284 dated 24/10/2016 does not comply with the requirements of The Patents Act, 1970 (as amended). I, therefore, hereby order that the grant of a patent for application no. 201617036284 is refused under the provisions of Section 15 of The Patents Act, 1970 (as amended)."*

7. Learned counsel for the Appellant argued that the impugned order is untenable in law. Respondent has failed to consider the detailed submissions made in response to the FER and post-hearing written submissions as also the fact that claims were amended to address the objections raised in the FER and hearing notice. The amended set of claims 1-5 involve inventive step and are compliant with Section 2(1)(ja) of 1970 Act and therefore, Respondent has erred in holding that the claimed invention lacks inventive step in view of prior arts D1 and D2. Respondent continued to rely on the objections raised and referred to D1 and D2 but as the order reflects there is no consideration of the differences brought out by the Appellant, which if considered, would have highlighted that a person skilled in the art could

never be motivated from the teachings of D1 and D2 to reach the claimed invention. Non-consideration of the written submissions is a reason good enough to set aside the order as held by this Court in ***Boehringer Ingelheim Vetmedica GMBH v. Controller of Patents, 2024 SCC OnLine Del 8578.***

8. It was urged that cited prior arts D1 and D2 do not disclose the features of claimed invention, taken individually or in combination and the person skilled in the art would not receive any suggestion or motivation from the cited documents to modify any technique disclosed to work as in the claimed invention. Independent claim 1 of the present application is a redundant control device used for a train controller in which an active system and a standby system operate in sync with each other and conceptually have a coordinated relationship and not a master-subordinate relationship. The synchronized active and standby systems include existing hardware such as CPUs serving as a control unit and a synchronous circuit for driving the CPUs in sync with each other. The systems mutually transmit/receive information by serial transmission. When the active system detects an error, error detection information is sent to the standby system to disable the output control data of the active system and switch to the output control data of the standby system. Prior to the switchover, the standby system has received the error detection information from the active system and thus the active system can be smoothly switched to the standby system.

9. It was argued that the characterized features in independent claim 1 are neither explicitly nor implicitly taught in any cited prior art document. D1 discloses a duplexed system for an operation processor but does not specify that it relates to trains. Present invention, according to claim 1 discloses a redundant control device used for a train controller in which an

active system and a standby system that are separately disposed in a front car and a last car among train cars; the active system and the standby system being connected and transmitting and receiving information by serial transmission; and the redundant control device being a low-cost device that does not distinguish a main system from a subordinate system, to thereby shorten a system switchover period. The advantageous effects as disclosed in paras [0038] and [0039] of the description are: (a) the two dual on-board controllers can be reduced by half and as a result cost is considerably saved; and (b) period for switching the active system to standby system can be shortened and thus the signal transmission time consumed by switchover can be saved. It is then possible to execute precise train control, for example, a train interval can be reduced to enhance the operational efficacy or the like. These advantages are specific to a case where device is used for a train controller and could not be conceived in D1, which is directed to a duplexed system for operational processor and does not teach that it relates to trains.

10. It was argued that Respondent has erred in refusing the application by taking D2 as the closest prior art. No doubt, D2 discloses a train control system but in D2, the train location information found by the on-train control device is transmitted to the ground control device via a standby dual system in a train control system being a dual system. The ground control device searches control information of a rear train based on the location information and then regulates brake control based on information transmitted from the ground device. The input of the received data from the ground device and the train control based on the input are performed via parallel dual system. It was explained that in D2, when a main system fails, the location information of a slave system is informed to the ground device by switching the connection with an on-train radio set from the main system

to the slave system by a switching mechanism. Thus, D2 does not disclose the configuration of the present invention as claimed in claim 1 i.e., a single dual on-board controller composed of the active system mounted on the first car and standby system mounted on the last car and cannot be an impediment to refuse the instant application.

11. It was argued that Section 2(1)(ja) defines 'inventive step' to mean a feature of an invention that involves technical advance as compared to existing knowledge or has economic significance or both and that makes the invention non-obvious to a person skilled in the art. Going by the definition, claim 1 of the present invention involves a technical advance over prior arts and has economic significance as it reduces the cost considerably. The period for switching the active system to the standby system can be shortened resulting in reduction of signal transmission time. It is accordingly possible to execute precise train control such as reduction of train interval to enhance operational efficacy. None of the cited documents D1 or D2 motivate a person skilled in the art to modify any technique disclosed in claim 1 and at least due to the presence of characterized features therein, it cannot be said that the invention lacks inventive step.

12. Ms. Nidhi Raman, learned CGSC appearing for the Respondent argued that the subject application was processed in accordance with provisions of the 1970 Act and refuted that the impugned order is a non-speaking or unreasoned order. Referring to the claimed invention, more particularly, independent claim 1, it was submitted that the invention lacks inventive step and does not fulfil the parameters of Section 2(1)(ja) of there being a technical advance as compared to existing knowledge or economic significance or both and that the invention should not be obvious to a person skilled in the art. Cited prior arts D1 and D2, whether taken alone or in

combination, fully disclose, suggest and teach the claimed invention in its entirety.

13. Elaborating the point, it was urged that D1 specifically discloses the claimed invention by describing a duplexed CPU control system with a primary and a secondary CPU, where the primary CPU controls the operation and the secondary snoops data while in a standby mode with communication paths. The secondary CPU performs data snooping as the primary CPU acquires control data. If the primary CPU fails, the secondary CPU takes over seamlessly, ensuring no data loss or delay in control operations. D1 also details how the control program can be updated on secondary CPU without requiring a shutdown of the plant system and with no additional functionality needed for this update process. Therefore, all elements of claimed invention, including duplexed operation, failover and ability to perform program updates without interrupting plant operations are explicitly disclosed in D1 which thus describes a fault-tolerant system. Failure to receive messages triggers the secondary CPU to automatically assume control and once the primary CPU is confirmed as faulty, it is effectively removed from the operation. This system supports synchronized operation, fault detection and autonomous control switchover without fixed master/slave designation, mirroring the functionality claimed. D1 further discloses system configuration with dual CPUs and communication circuitry and describes the ability of one CPU to assume control when the other fails.

14. It was further argued that D2 describes a train control system and is a dual-system configuration comprising a main system and a slave system that is held on standby. A switching mechanism designed to transfer operational control from the main system to the slave system in the event of a failure in the main system is provided. D2 discloses the method wherein this

switchover is seamlessly executed such that an external ground control device continues to receive necessary information without interruption or recognition of the on-board system failure and the explicit purpose is to ensure the operation rate of the train i.e., system availability and reliability. It is thus evident that concept of using a secondary standby control system to takeover from a failed primary system to prevent operational downtime is already known from D2.

15. Ms. Raman vehemently denied that there is no detailed technical analysis by the Respondent in the impugned order. Respondent has carried out analysis as required in the concerned regime in line with the law laid down by the Supreme Court in ***Biswanath Prasad Radhey Shyam v. Hindustan Metal Industries, (1979) 2 SCC 511,*** where it was held that obvious variations of known technology do not constitute an invention. Even though Appellant pointed out differences in the prior arts, more particularly, with respect to D1 urging that it does not specify that it relates to trains, the technology in the claimed invention, which employs duplexing for system reliability, is widely known in the industry, particularly in control systems and electronic devices and therefore, a mere use of the device in the train control system is not an invention and at the highest is an application of the technology. The dual structure of the system could easily be adapted for use in trains by a skilled engineer. Moreover, placement of the systems in train cars is an obvious modification as it is only a routine design choice for train systems and so is the placement of redundant systems across spatially distributed compartments for reliability or fail-safe design. Most importantly, the characterized portion of the final claims makes it clear that redundant control device is claimed on a standalone basis without any specific features of the train controller.

16. It was also argued that purported advantages such as faster switchover or cost-effectiveness are expected and inherent results of implementing known redundant control/duplexing systems techniques and are not inventive. D1 explicitly teaches switching control outputs upon fault detection. Self-diagnostic features prompting shutdown of the faulty system aligned with common engineering practices and their application in the train control domain is an obvious adaptation. While there is no explicit mention of applying a duplex control CPU in D1 to the train field, the dual structure of D1 can easily be adapted to the train field by a person skilled in the art. In D1 the waiting system CPU2 performs a function of operating system CPU1 upon detecting an error in the operating system. Further, D1 suggests that if the self-diagnostics of the paternal line indicate an error, the person skilled in the art, normally a technical engineer may stop the operation of the paternal line to ensure stable and energy efficient system operation. Therefore, as rightly held by the Respondent claimed invention lacks inventive step owing to prior arts D1 and D2.

17. In rejoinder, learned counsel for the Appellant urged that the mere fact that both the claimed invention and D1 and D2 fall within the broad domain of redundant duplex control systems, does not negate inventive step. In ***Avery Dennison Corporation v. Controller of Patents and Designs, 2022 SCC OnLine Del 3659,*** this Court held that simplicity does not defeat patentability. Respondent contends that adapting duplex control to trains is a routine field-of-use choice, however, the placement and interconnection in the claimed invention are not conventional. It is settled that inventive step must be assessed on a holistic basis and not by dissecting individual non-components. The Calcutta High Court held in ***Groz-Beckert KG v. Union of India, MANU/WB/0140/2023,*** that it is not sufficient to conclude

obviousness by isolating individual known parts. If the logic of the Respondent is accepted that obvious variations of known technology do not constitute invention, then no invention which is a combination of known techniques would ever proceed for patent.

18. It was argued that D1 and D2 neither teach nor suggest placement in separated train cars with the dedicated sync line, ensuring perfect phase alignment without handshake latency. Respondent suggests that applying redundant control to trains is an obvious adaptation, however, generic application of duplexing to trains would not inherently produce the specific claimed architecture i.e., physically separated controllers linked by serial lines. Reliance was placed on the judgment of this Court in ***Biomoneta Research Pvt. Ltd. v. Controller General of Patents Designs and Another, 2023 SCC OnLine Del 1482,*** where it was held that if there is synergistic combination or a working interrelation which produces a new and improved result, the subject matter is patentable. Reliance of the Respondent on the judgment in ***Biswanath Prasad (supra)*** is misplaced. The invention at hand is not a 'workshop variant' cosmetic aggregation. It represents an architecturally distinct design with new capabilities and no person skilled in the art, even with routine knowledge, would arrive at this invention. In this backdrop, it was urged that the impugned order be set aside and direction be issued to the Respondent to grant patent on the instant application.

19. Heard learned counsels for the parties and examined their rival submissions.

20. Instant patent application dated 30.03.2015 relates to an invention titled *"REDUNDANT CONTROL DEVICE AND SYSTEM SWITCHING METHOD"*. Respondent refused the application for grant of patent for lack

of inventive step under Section 2(1)(ja) of 1970 Act basis prior arts D1 and D2. The claimed invention is a redundant control device including an active system and a standby system and a method for switching systems therefor. As explained and also evident from the complete specification, object of the claimed invention is to provide a low-cost redundant control device that does not distinguish a main system from a subordinate system to shorten a system switchover period and a method for switching systems. The active system and the standby system operate in sync with each other. When the active system detects an error, error detection information is sent to the standby system to thereby disable output control data of the active system and switch to output control data of the standby system. The active and standby systems operate in sync in order to avoid discontinuity in output control data, which may possibly occur with the system switchover. The invention is applicable to train control, where the active and the standby systems are installed separately in the front and last cars of the train. Given the installation, two dual on-board controllers i.e., a dual on-board controller mounted on the first car and a dual on-board controller mounted on the last car can be reduced by half i.e., a single dual on-board controller composed of an active system mounted on the first car and the standby system mounted on the last car, which remarkably reduces the cost. The inventor claims that by the present invention, it is possible to provide a low-cost redundant control device that does not distinguish a main system from a subordinate system to thereby shorten a system switchover period and a method for switching systems therefor. The synchronized active and standby systems include existing hardware such as CPUs serving as a control unit and a synchronous circuit for driving the CPUs in sync with each other. The systems mutually transmit/receive information by serial transmission. When

the active system detects an error and the information is sent to the standby system to disable the output control data of the active system and switch to the output control data of the standby system. The standby system has in the meantime already received the error detection information prior to the switchover and thus, the active system smoothly switches to the standby system. Block diagram illustrating the configuration of the redundant control device of the claimed invention is Figure 1 and the diagram illustrating the application of the device to a train controller is Figure 2 below:-

Figure 1

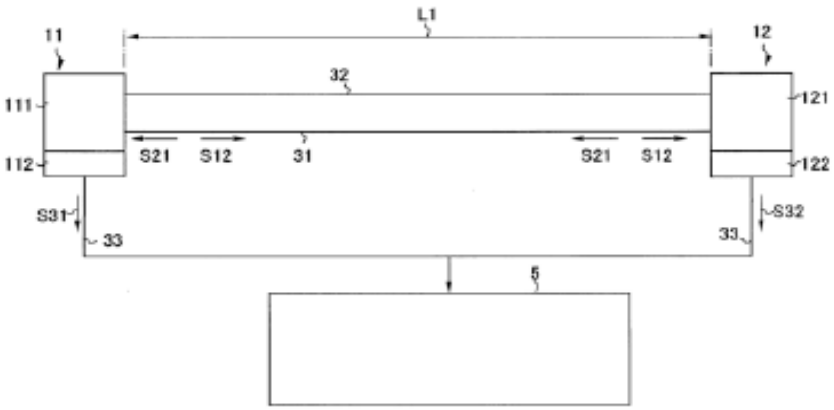
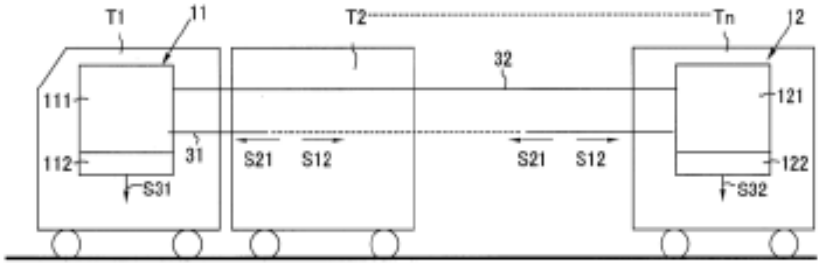


Figure 2



21. Case of the Appellant is that the application has been erroneously refused citing prior arts D1 and D2, whereas neither D1 nor D2 considered alone or in combination disclose, teach or suggest the features claimed in independent claim 1, which is extracted in the earlier part of the judgment.

Appellant submits that it was brought forth before the Respondent that D1 discloses a duplexed system for an operation processor, but does not specify that it relates to trains. Present invention, on the other hand, relates to a redundant control device use for a train controller and the advantageous effects as disclosed in paras [0038] and [0039] of the description are that the two dual on-board controllers can be reduced to half which saves cost and switching period is shorten, whereby signal transmission time consumed by switchover can be saved. This helps in executing precise train control, for example, a train interval can be reduced to enhance the operational efficacy. It is urged that these advantages are specific to a case, where device is used for a train controller and D1 could not conceive these advantages and hence, reliance on D1 by the Respondent was wholly misplaced.

22. Appellant also sought to distinguish prior art D2 before the Respondent and submitted that while D2 discloses a train control system but the train location information found in the on-train control device is transmitted to the ground control device via a standby dual system, in a train control system being a dual system. The ground control device searches control information of a last train based on the location information. The on-train control device conducts brake control based on the control information transmitted from the ground control device. The input of the received data and the train control based on the input are performed via a parallel dual system. When a main system causes failure, the location information of a slave system is informed to the ground control device by switching the connection with an on-train radio set from the main system to the slave system by a switching mechanism. Thus, D2 does not disclose the configuration of the present invention i.e., a single dual on-board controller

composed of the active system mounted on the first car and standby system mounted on the last car and cannot defeat the claimed invention. None of the cited prior arts, therefore, motivate a person skilled in the art to modify any technique disclosed in claim 1 especially due to presence of characterized features therein.

23. Appellant also brought forth before the Respondent that the claimed invention involves an inventive step and compared to the prior arts it has economic significance, whereby the cost can be considerably saved as also technical advance since the period for switching the active system to the standby system can be shortened, whereby signal transmission time consumed by the switchover will be saved and further, it is possible to execute precise train control. As an instance, it was cited that a train interval can be reduced to enhance the operational efficacy. The assertion before the Respondent was that the claimed invention introduces inventive operational steps and functional interrelationships between components which have distinct technical advantages and none of them are taught by D1 and D2. Differences have been highlighted in a comparative chart as follows:-

Appellants invention	*D1 (features as cited by the respondent)*
Claim 1: **Pre characterizing portion**: "*A redundant control device used for a train controller in which an active system (11) and a standby system (12) that are separately disposed in a front car (T1) and a last car (Tn) among train cars (T1,*	**Claim 1 of D1**: In D1 there is no mention of trains. D1 discloses a duplexed system for an operation processor (CPU) used in a plant control. In D1, communication path 6 is used for casual or background communication between CPU 1 and CPU 2, where tight timing/sync is not needed—like Ethernet communication. (See para 0021). It's not used for the precise, cycle-aligned synchronization that the subject invention enables through a dedicated sync line (*31, 32*).

T2, ..., and Tn), the active system (11) and the standby system (12) being connected via lines (31, 32) and transmitting and receiving information by serial transmission, the redundant control device being a low cost device that does not distinguish a main system from a subordinate system, to thereby shorten a system switchover period, characterized in that:"	D1 does not teach or suggest the real-time, phase-locked synchronization that is essential to the subject invention. **Para 24**: D1 allows either of the CPU to be assigned as the primary (active) or secondary (standby) but it is predefined (set in advance), either at design time or boot time. Once defined, one CPU is designated to be in control (primary), and the other is on standby unless a fault is detected. Even if roles can be reversed later (after a switchover), they are still operating in a master–slave hierarchy at any given time, i.e. D1 does allow role switching on fault, but still within a hierarchical framework—and it relies on multi-frame handshakes rather than continuous phase synchronization (paras [0041]–[0047]). The subject invention describes a symmetric, non-hierarchical control system, where there is no permanent assignment of primary or secondary roles. Both controllers operate in perfect sync and coordinate outputs dynamically. Either controller can become active without any predefinition or configuration based on real-time status and error detection. This distinction is made clear in the subject inventions specification, which explains: "the active system and standby system are constructed without distinguishing a main system and a subordinate system... thus reducing cost and complexity."
Post-characterizing portion:	

the active system (11) and the standby system (12) operate in sync with each other, and	**Claim 1 of D1**: While D1 allows switching and mentions synchronous snooping, it does not disclose or suggest a fully phase-synchronized, symmetrically coordinated system as in the subject invention. The subject invention execute next-cycle takeover, and reduce cost and complexity through simple serial links and sync signals representing a distinct technical advance over D1.
if the active system (11) detects an error, the active system (11) sends error detection information (S12) to the standby system (12), and	**Claim 4, para 0031 & 0052, of D1**: The secondary CPU (CPU2) is inactive until a switch-over is triggered, and relies on frame monitoring or fault reports. In the subject invention, the standby system is always active, fully synchronized, and takes over immediately in the next cycle after receiving S12, the error detection signal.
then, output control data (S31) of the active system (11) is disabled and is switched to output control data (S32) of the standby system (12), and	**Claim 3 and para 0055 of D1**: While D1 describes that CPU1 performs self-diagnosis, and may stop operation when a fault is detected, the CPU2 takes over only after detecting that communication from CPU1 has stopped — for example, by monitoring the periodic output of frames. The switch-over in D1 also involves changing the communication path to the I/O device (3) from CPU1 to CPU2, which is implied in paras [0046]–[0055]. CPU2 then starts sending control data to the I/O device in place of CPU1 (Claim 3, para [0055]). In contrast, the subject invention uses a sync line (32) to ensure both systems (active and standby) operate in phase synchronization, with both generating control data (S31, S32) continuously. Upon detecting an error, the active system sends error detection information (S12) and disables its

	own output (S31). The standby system, already synchronized, then enables its output (S32) — all without needing to switch the communication path or reassign control of the I/O.
if the active system (11) still detects an error, the active system (11) is confirmed as having failed, and is stopped.	**Claim 4** (*not 3 as cited*) **and para 0062 of D1**: While D1 uses frame-based fault inference and requires communication with the I/O device to reassign CPU control (via switch-over request/acknowledge frames), the subject invention enables the active controller itself to determine and confirm failure, and simply stop output, triggering the standby controller (already synchronized) to take over immediately — without switching communication paths or waiting for acknowledgment. The subject invention achieves a simpler, faster, and structurally distinct switchover mechanism that is not disclosed or suggested in D1.
Claim 2: Wherein after the output control data (S32) of the standby system (12) is used, if the active system (11) detects no error, the output control data (S31) of the active system (11) is used.	**D1 para 0020, 0032, 0039, 0058, 0060, 0065**: The subject invention provides a recoverable switchover: after the standby output (S32) is used, if the original active system (11) detects no error, it resumes output (S31) and regains control. By contrast, in D1 (at para 0062) once CPU1 is confirmed faulty and CPU2 takes over, "the CPU1 that has been detected to be currently in trouble will not be switched over to the primary," so CPU1 cannot return as primary. Thus, the subject invention bidirectional, reversible switchover is not taught or suggested by D1's permanent, one-way failover structure.

Claim 3: Wherein the active system (11) and the standby system (12) include a CPU (111, 121) and an interface unit (112, 122), and supply output control data (S32) from the interface unit (112, 122) to a controlled device (5) via an output control data line (33).	**D1 para 0019**: D1 discloses two processors each connected via buses 5/6 into a single, shared I/O device 3, which then drives the control target. In the subject invention, by contrast, each CPU (111/121) has its own dedicated interface unit (112/122) and its own output-control-data line 33 directly to the controlled device.
Claim 4: A method for switching systems for a redundant control device used for a train controller in which an active system (11) and a standby system (12) that are separately disposed in a front car (T1) and a last car (Tn) among train cars (T1, T2, ..., and Tn), the active system (11) and the standby system (12) being connected via	**D1's claims 6, 7, 10 and para 0023, 0029, 0031**: Whereas D1's method relies on secondary CPU 2 "snooping" via snoop request frame 37, monitoring healthy status frames 15, and performing a CPU switch-over through I/O device 3 using switch-over request/acknowledge frames 51/52, the subject invention instead employs a dedicated sync line 32, direct error-detection information (S12), and local disable/enable of output-control-data (S31/S32) on each controller's interface unit 112/122, achieving next-cycle switchover without bus reassignment or multi-frame handshakes. These differences in structure and protocol demonstrate that D1 neither discloses nor suggests the method of the subject invention.

lines (31, 32) and transmitting and receiving information by serial transmission, the redundant control device being low cost device that does not distinguish a main system from a subordinate system to thereby shorten a system switchover period, comprising the steps of: synchronizing the active system (11) and the standby system (12) in sync with each other; sending from the active system (11), if the active system (11) detects an error, error detection information (S12) to the standby system (12); disabling output control data (S31) of the active system (11) and switching to output control data (S32) of the standby system (12) , and stopping the active system (11) itself if the	

active system (11) still detects an error at a next cycle.	
Claim 5: Wherein at the next cycle after the step in which the output control data (S31) of the active system (11) is disabled and switched to the output control data (S32) of the standby system (12), if the active system (11) detects no error, further comprising the step of disabling the output control data (S32) of the standby system (12) and switching to the output control data (S31) of the active system (11).	**D1 para 0020, 0032, 0039, 0058, 0060, 0065**: The subject invention's "switch-back" to enable S31 upon the active system's recovery is absent from D1. D1's clearly states that once CPU 1 is deemed faulty and CPU 2 has taken over, CPU 1 "will not be switched over to the primary" again. Therefore, the reversible switchover feature of the subject invention is not taught or suggested by D1.

24. The written submissions filed before the Respondent clearly reflect that all these distinctions, which according to the Appellant are crucial, were highlighted. However, a plain reading of the impugned order shows that paragraphs 1 and 2 deal with the prosecution history and paragraph 3 refers

to objections raised in the hearing notice and response to the FER. Taking note of the reply, one line observation is made that newly cited document D2 along with D1 cited in the FER discloses the features in the invention. Prior art D2 is then explained including the working of CPU1 and CPU2 therein but without any further consideration or reasoning, conclusion is reached that subject matter of the claimed invention lacks inventive step under Section 2(1)(j) of 1970 Act. Thereafter, Respondent refers to the objections raised earlier on non-patentability under Section 3 and Section 10(4)(c) paragraphs 4 and 5 refer to the submissions made. Paragraph 6 reflects that Respondent considered D1 as cited in FER and hearing notice. Paragraph 7 refers to the subject invention as described and paragraph 8 extracts the submission of the applicant. Paragraph 9 refers to the decision of this Court in ***F. Hoffmann (supra)*** with regard to the obviousness test as also the judgment in ***Biswanath Prasad (supra),*** for the proposition that person skilled in the art would pre-suppose that the person has knowledge and skill in the field of art concerned and from that angle one has to see if the prior art document can be worked upon in the workshop to achieve the subject invention under challenge. In paragraph 10, Respondent notes that the person skilled in the art is a normal technical engineer and would have knowledge of the disclosures in D1 and D2. In paragraph 11, Respondent carries out analysis of D1 as the closest prior art and concludes that since prior art discloses active and standby systems, which operate in sync with each other and on detection of error in the active system, the information is sent to the standby system, whereafter output data in the active system is disabled and switched to that of the standby system as also that D1 discloses primary/secondary CPU switchover process in another condition, where secondary CPU does not consecutively confirm arrivals of snooping request

related frames to be sent from the primary CPU if in a normal state, D1 teaches that when error is detected by a system, failure is determined and only the standby system performs operational control and those skilled in the art will readily recognise that the system action is halted, when there is a system failure. In respect of D2, it is observed that the prior art discloses dual system, where on-board controller which generates position information is transmitted to the ground control device via a standby dual system and the input of the received data from the ground device and the train control device on the input are performed via a parallel dual system and hence, when a main system fails, location information goes to the slave system and from there to the ground control device by switching the connection with and on-train radio set from the main system to the slave system by a switching mechanism. Therefore, as per the Respondent the claimed invention is obvious to a person skilled in the art in light of D1 and D2 and common general knowledge.

25. Plain reading of the impugned order fortifies the stand of the learned counsel for the Appellant that the important inventive features brought forth are not even dealt with in the impugned order and the order is completely coloured by the perception of the Respondent that D1 and D2 make the claimed invention obvious to the person skilled in the art. Principles for determining whether a claimed invention lacks inventive step under Section 2(1)(ja) of 1970 Act are settled. In ***Agriboard International LLC v. Deputy Controller of Patents and Designs, 2022 SCC OnLine Del 940,*** this Court held that Controller has to analyse as to what is the existing knowledge and how person skilled in the art would move from the existing knowledge to the subject invention. In ***Avery Dennison (supra),*** this Court emphasized the could-would approach, wherein the question that is required to be raised is

whether there is any teaching in the prior art as a whole that 'would' and not simply 'could' have prompted a person skilled in the art with the knowledge of the objective technical problem to either modify or adapt the closest prior art to arrive at the subject matter of the claims. It is also settled that motive of the skilled person is a relevant consideration. The notional skilled person is not assumed to undertake technical trials for the sake of doing so but rather because he or she has some end in mind. It is not sufficient that a skilled person could undertake a particular trial and the question is whether in the circumstances he would be motivated to do so and absence of motive to take the inventive step will make it difficult to conclude that the invention is obvious.

26. Appellant has consistently asserted that there are material and crucial differences between D1 and D2 and the claimed invention as also that the mere fact that the prior arts fall within the broad domain of a redundant control device does not negate the inventive step and as rightly pointed out, simplicity does not defeat patentability and inventive step must be judge without hindsight. It is highlighted that claimed invention is not limited to generic duplexing or mere CPU failure and instead the claims are specific system architecture and method that places the active and standby controllers in physically separated train cars, linked only by simple serial lines and utilizes a dedicated sync line to maintain perfect phase-aligned control cycles across those separated controllers, enabling instant switchover without the handshake or mirror memory compare required by conventional designs like D1. Appellant seriously contests Respondent's position that faster switchover is an expected result of known duplex systems since in the present system synchronization via the dedicated sync line allows standby system to takeover immediately in the next cycle without waiting for

acknowledgments, whereas in D1 switchover relies on multi-step handshake protocol.

27. From the arguments of the Appellant, it is apparent that it also contests Respondent's findings that cost effectiveness is an expected outcome of any redundant system. It is urged that claimed invention reduces cost specifically by eliminating mirror-memory hardware and relay-based switch-over circuits entirely, using only two serial lines between cars instead of a complex parallel bus or high-bandwidth memory interface supporting symmetric coordination so that either side can be active or standby without preconfigured master/slave roles. Appellant has also emphasized that in D1 the secondary CPU is inactive until a switchover is triggered and it relies on frame monitoring of fault reports while in the subject invention the standby system is always active, fully synchronized and takes over immediately in the next cycle. The switchover in D1 also involves changing communication path to the I/O device from CPU1 to CPU2, which then starts sending control data to the I/O device in place of CPU1, whereas in subject invention a sync line is used to ensure that both systems operate in phase synchronization, with both generating control data continuously. In D1 once CPU1 is confirmed faulty and CPU2 takes over, CPU1 that has been detected to be currently in trouble will not be switched over to the primary, whereas in the claimed invention there is a recoverable switchover after the standby output is used and if the original active system detects no error, it resumes output and regains control. Thus, the subject invention's bi-directional and reversible switchover is not taught or suggested by D1's permanent, one-way fail over structure. Similar differences as noted above, have been highlighted *qua* D2 but there is no consideration, least of all even a mention in the impugned order. No doubt it is Respondent's prerogative

and expertise to decide whether a claimed invention is involves an inventive step, but the decision must be reasoned and based on material facts and scientific reasoning and moreover, Respondent is under an obligation to consider all relevant points raised by an applicant, analyse it and then pass an order. Learned counsel for the Appellant rightly urged that Respondent has failed to consider the detailed submissions made in response to the FER and post-hearing written submissions as also the fact that claims were amended to address the objections raised in the FER and hearing notice. Appellant brought forth that the amended set of claims 1-5 involve inventive step and are compliant with Section 2(1)(ja) of 1970 Act and gave detailed analysis in the written submission why reliance on prior arts D1 and D2 was incorrect, but Respondent continued to rely on the objections raised and did not consider the differences brought out. Non-consideration of the written submissions has been held to be a reason good enough for remand of the matter to the Controller in ***Boehringer Ingelheim (supra).*** For all the aforesaid reasons, in my view, this is a fit case for remand to the Respondent for fresh consideration.

28. Accordingly, the impugned order dated 18.07.2024 is quashed and set aside. Respondent shall consider the Indian Patent Application No.201617036284 afresh, taking into consideration the submissions of the Appellant made in response to the FER as also in the post-hearing written submissions and this appeal. Determination of inventive step shall be carried out in accordance with the law on the subject as detailed in the judgements referred to above on the subject. Decision will be taken within a period of four months from today after granting opportunity of hearing to the Appellant.

29. It is made clear that this Court has not expressed any opinion on the merits of the case.

30. Appeal stands partially allowed and disposed of.

JYOTI SINGH, J.

MAY 29 , 2026*/YA*