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1. What led to the mishap involving the Kanchanjunga Express in north Bengal?

Why in News?

On June 17, a train accident killed 10 people and injured over 40 near New Jalpaiguri in West Bengal, about 600 km from Kolkata. The mishap was caused when a goods train hit the 13174 Down Agartala Sealdah Kanchanjunga Express in the rear at 8.55 a.m. The two trains were manually cleared to run in the same block section, a mere 15 minutes apart, since automatic signalling was malfunctioning between the Ranipatra and Chattar Hat stations which fall under the Northeast Frontier Railway.

What was initial response of Railway Board?

The Railway Board initially said the prima facie cause of the accident was that the loco pilot of the goods train, who died in the accident, disregarded the Railways' General and Subsidiary Rules (G&SR) and proceeded at normal speed which led to the collision with the Kanchanjunga Express. The Railways has ordered a statutory inquiry.

Who is at fault?

The Railway Board initially blamed the loco pilot of the goods train; this was later rescinded, but the damage had already been done. It is impossible to operate a train across a block section on the instruction of one person; there's a chain of command and a list of procedures that need to be followed.

For instance, the station masters of stations between which a train is running, the section controller (who is stationed at the divisional headquarters and monitors all rake movements), the signal staff and the gatemen between the stations have to be informed in a particular manner, and a line clearance obtained before a train leaves a station. If there is a discrepancy — like an automatic signal failure, for example — it has to be immediately escalated.

In this case, the Katihar division (where the accident occurred) Railway Manager Surendra Kumar stated on record that the gateman had informed Rangapani station about the goods train on the same track as the Kanchanjunga Express. An inquiry will take into consideration this statement, and explore who all were privy to this information. While the inquiry will establish the shortcomings which led to the accident, the Railways has often been seen to take action against lower level staff, while officers at higher levels have gone scot-free after accidents.

Is signal failure a routine event?
In a paper, 'Analysis Report by High Level Safety Review Committee,' (2017), Mukesh Mehrotra, a chief signal engineer, noted that only 3% of the accidents in Indian Railways are due to "failure of equipment." During signal failure, trains can be operated under caution. The station master issues a TA-912 notice, which authorises loco pilots to cross a signal in red during signal failures, and a 'line clear' ticket, under the G&SR. The combination empowers the loco pilot to move forward. In this situation, the rule book says that the "driver shall proceed cautiously, so as to stop short [at] any obstruction."

But if there is no prior indication that a signal is defective and the loco pilot suddenly encounters a red signal (stop sign) when the train is on the move, the loco pilot has to stop at the defective signal for a minute during day time, and for two minutes during night time. After this, the loco pilot is expected to proceed with extreme caution at a speed of 15 kmph. This procedure is not applicable when a 'line clear' ticket has been issued. Trains are not detained at wayside stations till the signals are set right. The only rule is that there should be only one train between two block sections at any given point of time. Another train can enter only after this train has left that block section.

Would Kavach have prevented the accident?
Yes. But the much-touted anti-collision device, Kavach, was not installed on this route. Kavach would have slowed down the freight train (it was moving at 45 kmph at the time of accident) as the automatic braking system would have become operational. However, progress on implementation of Kavach has been slow because of lack of vendors. According to the Railway Board, the Kavach system is operational in only 1,500 km. The entire Railways spans nearly 68,000 km.

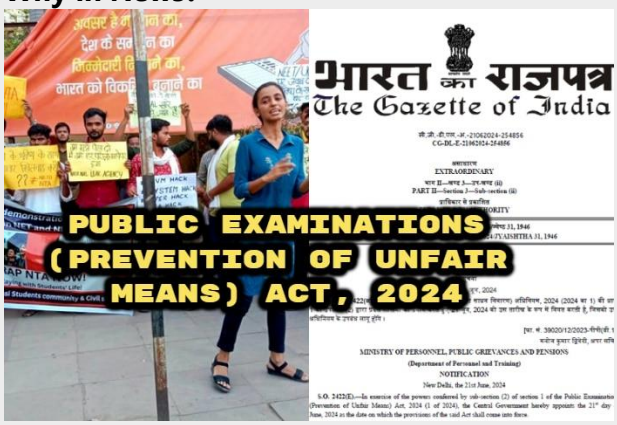
Railway accidents are rare if one takes this statistic into consideration: a minuscule 0.03 accidents happened per million km in both 2020-21 and 2021-22. But this number becomes infructuous if we consider the fact that there were 34 consequential train accidents in 2021-22 in which nine were killed and 45 injured. In 2022-23, however, there were 48 consequential train accidents. In fact, June 2023 witnessed the worst train accident in about two decades in Balasore, where nearly 300 passengers died.

What more needs to be done?
Several committees have closely examined the question of Railway safety. While some of the recommendations have been accepted, others have not been considered for implementation. For instance, one of the most important recommendations of the Kakodkar Committee is related to division of responsibilities: "Three vital functions (rule-making, operations and the regulation) are all vested in the Railway Board. There is need for an independent mechanism for safety regulation. The Committee recommends the creation of a statutory Railway Safety Authority with enough powers to have a safety oversight on the operational mode of Railways."

Relevance: GS Prelims & Mains Paper III; Internal Security
Source: The Hindu

2. How Public Examinations Act can deal with with cheating

Why in News?



The Centre notified the Rules required to operationalise The Public Examinations (Prevention of Unfair Means) Act, 2024, the anti-cheating law passed by Parliament in February. The law itself came into force on June 21, after it was notified in the official gazette.

The Rules notified by the Ministry of Personnel, Public Grievances and Pensions, provide a framework of actions to prevent the use of unfair means in public examinations, including appointing Centre Coordinators, venue in-charges, and Regional Officers.

The government is under great pressure from the opposition and protesting students across the country after being forced to postpone the UGC-NET, CSIR UGC NET, and NEET PG competitive exams. The CBI is investigating NEET UG after investigators in Bihar found evidence of a paper leak.

What the Rules say

COMPUTER-BASED TEST: The Rules lay down full parameters of Computer Based Tests (CBT) — from the registration of candidates, allocation of centres, and issue of admit cards to the opening and distribution of question papers, evaluation of answers, and the final recommendations.

The central government's National Recruitment Agency shall prepare the norms, standards, and guidelines for CBTs in consultation with stakeholders. Once finalised, these norms will be notified by the Centre.

The notified norms, standards, and guidelines shall cover both physical and digital infrastructure and activities, including the standard operating procedure (SOP) for registration of public examination centres; space requirements at CBT centres and layout of seating; specifications and layout of computer nodes, server and network infrastructure, and the electronic platform; candidate check in, biometric registration, security and screening; setting and loading of question papers; invigilation; and all post-examination activities.

CENTRE COORDINATOR: The Rules provide for the appointment of a Centre Coordinator for Public Examinations, who may be "serving or retired employees of the Central Government, State Government, Public Sector Undertakings, Public Sector Banks, Government Universities, autonomous bodies and other Government Organisations".

According to the Rules, the Centre Coordinator shall be the representative of the public examination authority for coordination of activities of the various service providers and the

examination authority, and for overseeing the compliance of all norms, standards, and guidelines for the exam.

Public examination

Which exams are covered by the law?

Section 2(k) of The Public Examinations (Prevention of Unfair Means) Act, 2024 defines a "public examination" as "any examination conducted by the public examination authority" listed in the Schedule of the Act, or any "such other authority as may be notified by the Central Government".

The Schedule lists five public examination authorities: (i) Union Public Service Commission (UPSC) (ii) Staff Selection Commission (SSC) (iii) the Railway Recruitment Boards (RRBs), (iv) Institute of Banking Personnel Selection (IBPS) (v) National Testing Agency (NTA).

Apart from these designated public examination authorities, all "Ministries or Departments of the Central Government and their attached and subordinate offices for recruitment of staff" also come under the purview of the new law.

The central government can add new authorities in the Schedule through a notification as and when required.

Use of unfair means

What constitutes the use of unfair means for the purposes of the Act?

Section 3 of the Act lists 15 actions that amount to using unfair means in public examinations "for monetary or wrongful gain".

These actions include: "leakage of question paper or answer key or part thereof" and colluding in such leakage; "accessing or taking possession of question paper or an Optical Mark Recognition response sheet without authority"; "tampering with answer sheets including Optical Mark Recognition response sheets"; "providing solution to one or more questions by any unauthorised person during a public examination", and "directly or indirectly assisting the candidate" in a public examination.

The section also lists "tampering with any document necessary for short-listing of candidates or finalising the merit or rank of a candidate"; "tampering with the computer network or a computer resource or a computer system"; "creation of fake website" and "conduct of fake examination, issuance of fake admit cards or offer letters to cheat or for monetary gain" as illegal acts.

The Rules notified provide a detailed framework and format for reporting incidents of use of unfair means.

Rationale for the law

The ongoing controversy over alleged paper leaks would appear to provide an obvious justification for such an Act, and future incidents of the use of unfair means in examinations will be prosecuted under the provisions of the law.

There have been a very large number of cases of question paper leaks in recruitment exams across the country in recent years.

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

3. Power markets in India: their working, advantages, and the road ahead

Introduction

To meet peak power demand during the unusually hot summer, the government has allowed the trading of surplus electricity generated from "linkage coal" in the country's power markets. Coal linkages are typically made by the government to thermal units against long-term power purchase agreements (PPAs) with distribution companies (discoms). Power markets offer a flexible, reliable, and transparent alternative to PPAs, enabling generators to respond swiftly to demand fluctuations and sell surplus power at market-determined prices.

Power purchase agreements (PPAs)

To sell their electricity, generation units in India have traditionally used long-term PPAs that typically span 25 years. These agreements commit generators to supply power to buyers, usually public utilities, at fixed rates. PPAs are gradually losing favour due to their inflexibility in adapting to dynamic market conditions, and their tendency to lock in significant generating capacity.

Power Markets

Power markets, on the other hand, allow generators to respond to short-term demand fluctuations and sell surplus power independently of PPAs at market prices. The flexibility is particularly beneficial for generators of renewable energy, who may produce excess power during the off-peak hours. Instead of curtailing generation, the surplus can be traded on the market.

Price-based demand response involves multiple parties, and typically results in greater reliability and transparency in trading compared to bilateral contracts. This market-driven approach enables generators to optimise their output and revenue, while helping utilities meet variable power demands more efficiently.

How power markets work

Buyers make bids for the purchase of electricity, and sellers make offers. The market clearing price — the price at which electricity is traded — is determined by the equilibrium of demand bids and supply offers.

Power markets are categorised on the basis of electricity delivery timing and duration of contract. The spot market includes the real-time market (RTM) for near-immediate delivery and the intraday market for same-day trades hours before delivery. Contract markets, on the other hand, facilitate longer-term trades.

The renewable energy certificates (REC) mechanism allows utilities to meet renewable purchase obligations (RPOs) by buying RECs, each representing 1 MWh of renewable electricity. This system benefits states that lack sufficient renewable capacity, and enables them to purchase RECs for green energy generated elsewhere. Utilities that exceed RPO targets can trade extra RECs to allow other utilities to meet their targets.

Power exchanges in India

Power markets are hosted on a power exchange. Exchanges facilitate competitive pricing, improved resource allocation, and greater market liquidity in the power sector. Power exchanges were first introduced in Europe in 1990-91, and they now operate in about 50 countries around the world. The Electricity Act of 2003 established the framework for exchange operations in India, and exchanges commenced in 2008.

The spot market was introduced in 2020, which further enhanced the flexibility and responsiveness of the power trading system.

India has three major power exchanges regulated by the Central Electricity Regulatory Commission (CERC), where generators, utilities, and large consumers trade electricity. The Indian Energy Exchange Ltd (IEX) dominates with more than 90% market share, followed by Power Exchange India Limited (PXIL) and Hindustan Power Exchange Ltd (HPX).

In FY 2023-24, IEX traded about 110 billion units (BU) of electricity, growing 14% year-on-year. This represents almost 7% of India's total power demand, which reached 1,626 BU in FY24. The government has recently amended various regulations to encourage and incentivise participation in power exchanges, reflecting their growing importance in India's electricity market.

Road ahead for exchanges

Indian regulators are exploring market coupling and capacity markets as the next evolutionary step for the country's power markets.

Market coupling is a process that matches bids from all power exchanges to discover a uniform market clearing price, which also acts as a reliable reference price for policymakers. The concept, first introduced in CERC's Power Market Regulations, 2021, could lead to more efficient price discovery, reduced price disparities across regions, and increased market stability.

Capacity markets, on the other hand, would allow generators to be paid for their available capacity, not just for the electricity they produce. This mechanism is aimed at ensuring long-term grid reliability by incentivising investment in generation capacity, particularly for peaking power plants that may not run frequently but are crucial during high-demand periods.

Only a few countries, including the United Kingdom, parts of Australia, and South Korea, have developed capacity markets. The introduction of these advanced market structures would align India's power markets more closely with mature international markets, potentially attracting more investment and fostering greater competition in the sector.

Relevance: GS Prelims & Mains Paper III; Economics
Source: Indian Express