TRAIN DERAILMENTS: AN EMERGING TERROR THREAT IN INDIA
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EXECUTIVE SUMMARY

The evolution of global terrorism over the past two years has been characterized by attacks conducted by self-motivated individuals radicalized by the Islamic State. Notably, however, such attacks have remained unsophisticated in nature, drawing upon fewer resources for execution.

Since 2014, Al Qaeda, which predominated the global jihadist sphere for much of the twenty-first century, saw itself losing territory and global perception to its offshoot, the Islamic State. Following a series of ‘lone-wolf’ attacks by Islamic State linked individuals in the West, Al Qaeda’s latest ‘Inspire’ magazine, titled ‘Train Derailment Operations’, offers intriguing clues into the jihadist group’s attempts to position itself as an inspirer of ‘lone wolf’ attacks. More so however, it is important to understand the magazine’s contents and timing of release not only in the context of Al Qaeda’s global posture but the impact of attacks against rail infrastructure entities and the methods incorporated to do so. Although the magazine focuses on the United States and other Western nations overall, the tactics and strategies proposed by AQ bear implications for countries beyond.

India, currently the world’s fastest growing economy has thus far been characterized by a comparatively proactive government led by Prime Minister Narendra Modi, particularly on matters concerning foreign investments and national security. The Modi administration since the 2014 general elections, has placed increasing priorities on foreign direct investments into railway infrastructure, where countries including Japan and Spain have expressed interest.

As part of its annual budget, the Government of India in 2017 allocated approximately 3.12 billion USD for rail safety alone.

Rail accidents in India are not uncommon, although, recent trends suggest that train derailments in India incorporate elements of crime and terrorism, in a pre planned and organized fashion. While it is difficult to measure the extent to which this has been the case, it is nonetheless a cause for concern among Indian authorities. Notably, an Islamic State linked cell in the Indian state of Uttar Pradesh was reportedly trained in train derailment methods. Regardless of whether the individuals were trained remotely by Islamic State commanders based abroad, or others are inspired by Al Qaeda in the future, the fact remains that jihadist groups have an expressed interest in attacking rail infrastructure.

Train derailments not only incur material and human costs but carry economic costs. Given the timing of AQ’s magazine amidst a series of fatal train derailments in India, the prospective rise of train derailments as a terrorist tactic, poses serious challenges for national security as well as economically in terms of foreign investments. In this context, it is crucial to realize India’s strengths and weaknesses with regards to rail security, in order to assess and address the impacts of such incidents.
TRAIN OF THOUGHT

The rise of what is commonly termed ‘lone wolf’ terrorism by Islamic State (IS) linked individuals, has shone the spotlight on unsophisticated attacks and their implications for the evolution of global terrorism. Al-Qaeda’s (AQ) latest ‘Inspire’ magazine issue titled ‘Train Derail Operations’ released on August 11, 2017, offers insights into the evolution of unsophisticated terrorist tactics. More so, the magazine sheds light on the Sunni jihadist group’s strategy following losses of territory and global perceptions, to IS. Interestingly, AQ acknowledges and assesses IS-linked attacks in a likely attempt to adjust the group’s outreach to would be lone actors while attempting to offer a more destructive form of lone wolf terrorism.

The contents of the magazine entail a comprehensive outline of the importance in targeting transportation infrastructure, methods, designs, and means of conducting attacks of this kind. While the magazine has a clear focus on targeting rail transport in the United States, the attack methods prescribed bear implications for rail transport in countries beyond the western hemisphere, such as India, as will be examined later.
This is not the first time Al-Qaeda has explored ‘lone wolf’ or unsophisticated attack methods. Anwar al-Awlaki, a former imam and prominent commander within Al-Qaeda in the Arabian Peninsula (AQAP) was thought to be the brains behind the ‘Inspire’ magazine series. Early publications of ‘Inspire’ from 2010 and 2011 entail a predominant focus on individual jihad or attacks by small groups of individuals, advocating attacks ranging from bombings as seen in Boston in 2013 to weaponizing vehicles to mow down large crowds. The similarities shared with attacks conducted by IS-linked individuals in Europe for instance, are striking. Notably, Awlaki’s methods served as inspiration for a number of foiled and successful plots in the United States.

In turn, this importantly showcases AQ’s transition of focus from what it views as ‘spectacular’ 9/11 style attacks to more simplified methods, over the past seven years. Although it is clear that AQ is not new to the idea of unsophisticated or individually conducted attacks, it is important to understand the timing of the magazine’s release, not only in the context of IS but the catastrophic yield of train derailments compared to shootings, vehicular or melee attacks. This is in addition to positioning AQ as a pioneer of highly destructive but unsophisticated attacks against rail infrastructure, making terrorism simplified and accessible.

Locations of serial train bombings
TARGETING TRANSPORTATION

Civilian and military transportation are not only symbols of globalization, but are governed by the successful implementation of security, and form a part of the day to day life. Transportation for the purposes discussed here can be categorized namely into air, maritime and land transportation. While attacks against military transportation as seen with the 2000 USS Cole bombing in Yemen, are seen as ideal for AQ, they are relatively difficult to execute on a wider scale due to advanced security measures compared to civilian transportation. In this case, it is not only the movement of goods, materials, and commodities that drives civilian transportation but the movement of people both domestically and internationally for multiple travel purposes including business, tourism, and leisure.

As such, an attack against civilian transportation is viewed by jihadist groups to yield a broader impact beyond the site of the incident and the target(s), given the economic significance attached to such entities, e.g. setbacks to a target country’s tourism industry or apprehensions amongst business investors who may seek alternative destinations considered safer.

Modes of transportation vary with respect to cost, efficiency, and speed. Air transport is the fastest commercial means of transporting people as well as goods, although the latter in smaller quantities. Maritime cargo transport is often the most internationally preferred means of moving commercial goods and commodities in bulk, despite being comparatively slower. The majority of India’s international trade, for example, takes place through the country’s sea ports. Rail transportation, on the other hand, is amongst the most commonly used means of transporting people as well as goods among European nations, and especially so in India; between cities and states, including for commercial purposes. Meanwhile, buses are mostly used for intracity transportation and to a lesser degree between cities in comparison. Overall, it is clear that there is a great deal of global dependency on the above-described means of transportation, for commercial and non-commercial purposes. In addition to dependency, it is complex to monitor and protect large swathes of rail networks, presenting such entities as emerging and ideal targets for jihadist groups.

According to ‘Inspire’ magazine, there are three types of transportation entities which can be targeted:
1) The principle vehicle.
2) The vehicle’s pathway or line of transportation.
3) Associated stations, terminals and/or transit points.

While jihadist groups such as AQ are seen as capable of targeting international means of transportation, and individual or lone actor may be more confined in capabilities to targeting internal transport networks and entities within a country.
THE VEHICLE

Targeting the means of transportation itself, an airplane, ship or train is seen as a high-value target amongst the above mentioned three transportation entities. Aside from the impact gained from targeting such entities, such attacks are seen by jihadist groups to demonstrate a greater degree of skill sets and capabilities, given the presumably exhaustive and complex security obstacles to overcome for an attacker. Additionally, such attacks even when attempted, are seen to expose flaws in security measures which prolong the reality of such threats and thereby, amplify public fear. More so, there is the economic impact to consider with regards to extending such threats to commercial transportation.

THE VEHICLE’S PATHWAY OR LINE OF TRANSPORTATION

As described in 'Inspire' magazine, attacks of this kind can be executed in two ways:

Disruption: For example, unhinging sections of railway tracks to delay the movement of trains or sabotaging sea lanes to close maritime transport channels.

Destruction: In this case, this involves the destruction of transportation pathways so as to inflict damage to the principal vehicle. For instance, destroying a section of railway tracks shortly before a train is scheduled to pass through the area in concern. 'Inspire' magazine additionally cites the targeting of commercial airliners using anti-aircraft weapons or maritime transport using sea mines.

Intriguingly, the magazine adds that the second type of attack is less impactful than the first despite the objective being damage to the principal vehicle. In this context, it is evident that jihadist groups such as AQ place the high value upon the economic impact in terms of financial losses, arising from terrorist attacks.

STATIONS & TERMINALS

The final transportation entity carries on from AQ’s emphasis on inflicting economic damage against target countries. As noted before, AQ acknowledges IS linked attacks here, when mentioning the March 2016 attacks in Brussels and the 2004 Madrid train bombings.

In contrast to actual attack styles, the magazine examines the impacts stemming from attacks of this kind, exploring both psychological and economic implications; public fears and enhanced security measures in cultivating a climate of fear, in addition to costs of rectifying material damage and implementing enhanced security measures including sophisticated technology and insurance.

Overall, AQ describes the three categories of transportation entities as forming a single whole, to make them the most vulnerable and convenient targets given their vast nature with varying degrees of security measures at each level. More so, AQ takes into account the abilities of lone actors to infiltrate and exploit such complex targets using limited resources, flexibility in deploying weapons or weaponizing existing structures, and well-planned execution.
TRAIN DERAILMENT OPERATIONS: HOW?

CONCEPT & DESIGN

The modus operandi proposed by AQ to execute train derailment operations borrows industrial concepts, utilized to conduct controlled derailments in order to avoid a larger degree of damage or loss of lives.

The image above depicts the structural concept of railway tracks and a standard industrial derailment tool.
Carrying on from this, AQ outlines a comprehensive procedure for assembling a train derailment tool utilizing simple and accessible materials, in a ‘Do-It-Yourself’ fashion:

**Example**
An illustration of a situation where a derail tool is used to derail a cargo train which is on a head-on collision with a passenger train. Thus preventing greater damage.

**DESIGN CONCEPT FOR THE HOMEMADE DERAIL TOOL**
The derail tool used by track management staff is designed using solid metal. As for us we will be using a simple method with readily available materials to design this tool. But before designing the actual tool we will cast a dummy model using Styrofoam as to simplify understanding the concept for the reader.

Below is a mold of the derail tool made using cardboard, we will then spray styrofoam inside the mold so as to form a cast for the derail tool. This will allow us to replicate the concept with ease.

**End Result**
Using the same method of casting shown above using Styrofoam and with the same measurements, we will be making a derail tool using reinforced concrete. The reinforced concrete will be our primary material in designing the derail tool.

The picture on the right shows us the end result of our simple homemade derail tool.

**NOTE:**
After the concrete solidifies and dries completely, spray it with water on a daily basis away from direct sunlight for a period of one month. This is so as to allow it to solidify and strengthen even more.

This part of the derail allows the protruding inner wheel of the train to ascend with ease.

This 45° inclination is to allow the wheel to easily ascend the derail tool as it comes into contact with it.
OPERATIONAL TACTICS

AQ takes note of how the speed of trains is a determining factor in the likelihood of a derailment accident; higher the speed, the likelier. Further, while damage, destruction and possible loss of life may occur as a result of train derailments, AQ specifies that derailments as a stand alone event do not maximise the catastrophic potential of train derailments, where environmental adjustments may enhance such prospects.

There are namely three types of train derailment operations proposed by AQ:

COLLISION

Deploying the train derailment tool on a railway line next to a large structure such as a building, for example, may achieve a train’s collision with that structure after derailing, especially at high speed.

![Diagram of collision scenarios]
DERAILMENT FROM HIGH GROUND

The distance between the train and the impact zone on the ground from an elevated area such as a bridge or mountain determines the extent of maximum damage occurring from this kind of train derailment.

DUAL OPERATION

In this category, the operational objectives emphasize not only destruction of the train and its occupants but also the surrounding vicinity of the incident. Examples of this would be derailing in highly sensitive or populated areas as well as of trains carrying hazardous materials. In turn, this concept enables higher casualties in addition to potentially incorporating Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) elements into a derailment style attack.
APPLICABILITY

AQ outlines favorable conditions for a successful derailment operation, including high speed, overcoming security measures and utilizing environmental factors to enhance the impact in the aftermath of a derailment.

In terms of high speed, the magazine makes an important distinction when specifying the importance for lone actors to know where trains may increase speed and where trains move at high speed. More so, the higher the speed of the train the more time and distance it requires to slow down to a level below a certain risk threshold. As such, certain locations or points in a rail line where trains at high speed are required to slow down, e.g. sharp corners and bends, densely populated areas, rail crossings, or when changing tracks. Additionally, AQ places knowledge of train schedules and details of the same in order to place a derailment tool ten minutes prior to its arrival at the targeted location.

While high-speed trains are commonplace in developed nations such as the United States or those in Europe, the question remains as to whether the same methods if applied in developing nations such as India, would yield desired results. Thus, it is important to measure the material and economic impact of potential attacks, and thereby assess what is the actual target e.g. individuals, infrastructure, investments, and so on.
COMPARE & CONTRAST

Train derailment operations, when compared to other attack styles such as bombings, suicide bombings, shootings and vehicular attacks, offer a number of favorable incentives to lone actors while achieving potentially destructive results. Additionally, AQ’s proposal in this regard juxtaposes its tactics against that of IS, as more convenient with higher destructive and economic impacts.

Train derailments derive from concepts of sabotage, eliminating the need for what jihadist groups term ‘martyrdom’; preserving the life of a lone actor. Given the simplistic design and concept incorporated, accessibility and capability apply to a wider range of prospective lone actors, while possibly incurring complexities for law enforcement authorities to trace evidence. The economic damage that comes with such types of attacks remains the key focus, e.g. countries such as the US, UK, and India. As large portions of rail networks are difficult to monitor, such attacks which do not necessarily require group level coordination or cooperation, remain difficult to prevent and react to in a time sensitive manner.

In the long run, while methods can be adapted and upgraded, AQ’s latest ‘Inspire’ magazine issue undoubtedly puts the spotlight on rail security, presenting a number of challenges ahead.

INDIA: A TARGET OF CONVENIENCE?

The latest derailment of the Kalinga Utkal express in Uttar Pradesh’s Muzaffarnagar district which led to the death of 23 and wounded 156 civilians was one of the major rail accidents in the country this year. The incident follows a similar derailment near Kanpur in November 2016, killing nearly 150 people in the single incident. These incidents come amidst a notable downtick in a number of rail related incidents as highlighted by the data provided by railway authorities. In 2014-15, the number of accidents was 135 which decreased to 107 in 2015-16 and further to 104 in 2016-17. Additionally, according to the Railnews, accidents per million train kilometers, an important index of safety, has come down from 0.23 in 2006-07 to 0.11 in 2014-15 and further to 0.10 in 2015-16. This difference has been attributed to introduction and implementation of various preventive technologies as well as increased vigilance at multiple levels in the security domain. Prior to this, the underlying threat of militancy is ever present, with the low-intensity IED detonation in Ujjain, later claimed by the Islamic State (IS)- inspired entities on March 7 being the most notable so far this year. Prior to the incident, in response to questions in Lok Sabha in February, Railway minister Suresh Prabhu highlighted that there have been seven blast attempts and three separate attempts to sabotage railway lines without specifying the exact locations or the timeframe. Irrespective of this, the high frequency of incidents involving train derailments witnessed in the preceding months continues to highlight the vulnerability of the existing rail network in the country. Though a number of instances may be attributed to the aging of tracks, rail fractures or laxity of staff, the possibility of a sizable chunk of these incidents are deliberately perpetrated by militants or criminal elements could not be completely ruled out.
EXISTING SECURITY FRAMEWORK AND STANDARD OPERATING PROCEDURES (SOP)

As per official railway sources, the Indian Railway remains the third largest in the world, catering to roughly 13 million passengers daily as of 2016. The responsibility of safety and protection of Indian Railway infrastructure is divided between Railway Protection Force (RPF) and Government Railway Police (GRP). The RPF is a security force directly under the Union government’s Ministry of Railways, and its primary responsibility is to safeguard and protect railway property, including rolling stock, the permanent way, and station or yard premises, from damage or sabotage and to investigate incidents of vandalism, theft, etc., of Indian Railway assets and property entrusted to it (i.e., freight).

The GRP, on the other hand, is a police organization under the control of the state government in each state, and its primary mission is the maintenance of law and order and ensuring passenger safety on board trains and on Indian Railway property. Thus the GRP concerns itself with robberies or other criminal incidents on board trains or on railway premises, missing person’s, injuries or deaths in connection with the railways, and has police powers in each state to arrest persons, register criminal cases, etc. (Such police powers for enforcing local law and order are constitutionally not available to anybody acting under the control of the union government.)

To ensure additional security coverage, local police forces are tasked with the responsibilities to ensure the security of rail infrastructure in their respective jurisdictions. The Central Reserve Police Force (CRPF) provides coverage in vulnerable areas especially in Jammu and Kashmir (J & K) and the Naxal infested areas, better known as ‘Red corridor’.

STANDARD OPERATING PROCEDURES (SOP’S)

Typically, a squad of armed RPF personnel is usually expected to be on board trains traversing through designated vulnerable zones, and part of the preliminary response to any security related contingencies that may emerge. Moreover, the GRP along with dog squads carry out a detailed assessment of the train wagons and tracks on major railway stations, including Mumbai, New Delhi, Bengaluru, and Kolkata. As part of the perimeter security, multiple entries and exit points are monitored through Integrated Security System (ISS) to strengthen surveillance mechanism at these stations. ISS comprises of Close Circuit Television (CCTV) Cameras, Access Control, Personal and Baggage Screening System and Bomb Detection and Disposal System. In this context 202 railway stations have been identified as vulnerable and decided to provide the ISS cover has been implemented on July 2017. Finally, additional reports also indicate the RPF increasingly deploying drones to enhance the surveillance capabilities of railway tracks and major railway stations.

According to the official government records, the present sanctioned strength of the RPF as of 2016 is 75,879 personnel. The troop strength of the GRP varies as per state. Despite official records, ensuring coverage of 1,08,706 kilometers of the rail network and 21,000 passenger and freight trains running daily, the existing force strength looks increasingly insufficient to fully cater to the evolving nature of security challenges posed to the railway infrastructure.
PERPETRATORS AND PATTERN OF ATTACKS SO FAR

The simple yet effective tools recommended by al-Qaida to attack the rail network, mentioned in the preceding section continues to pose serious challenges to the rail networks across the globe with Indian railway being no exception. This is further compounded by the vast stretch of the system, which remains unguarded for various operational and geographical constraints, through which the trains operate. Furthermore, in case of attacks on Indian Rail network till date, the majority of attacks have been recorded in the Red corridor- especially in Bihar, Chhattisgarh and Jharkhand by Communist Party of India- Maoist (CPI- M) cadres. While the majority of the recorded attacks have involved damage to the rail track using low-intensity explosives, instances of sabotage have also been recorded. In this context, attempts to sabotage typically involves cutting of railway tracks, removal of fish plates and elastic clips, removal of pedal clips, placing obstacles, typically boulders, heavy obstacles or vehicles especially near railway crossings among others. Peculiarly, a majority of attacks have been perpetrated during post midnight to early morning hours. This is typical to avoid security patrols along the rail tracks, thus mitigating the possibility of detection and increasing a probability of a successful attack.

Moreover, the modus operandi employed in targeting the railways makes it increasingly difficult to differentiate an act of sabotage possibly carried out by anti-social elements or criminal gangs from that of a militant attack. Irrespective of the perpetrator, available data continues to highlight that despite a downturn in a number of train accidents, there has been a surge in the intensity and ensuring casualty figures in recent months. Moreover, of the 14 major rail derailment incidents recorded between February 2016- August 2017, seven were recorded in the state of Uttar Pradesh alone, the derailment near Kanpur being most notable. Keeping in mind the fact that the state has previously witnessed a high militant presence of the Indian Mujahideen (IM) cadres, the possibility of at least some of the incidents being perpetrated by the militant group or elements sympathetic to the militant cause cannot be completely ruled out. This view is further bolstered by the investigation by the National Investigation Agency (NIA), which revealed that the perpetrators of the Ujjain blast in Madhya Pradesh were trained in derailment methods, including planting of IEDs, cutting tracks, placing heavy obstructions, unlocking track bolts and digging under the track. Though the group has been latent over the recent years following the crackdown by security forces, it continues to pose underlying security challenge.

EXISTING SECURITY GAPS

Among the host of security challenges, the three most glaring loopholes which continue to be pressing issues with respect to security of railway infrastructure are as follows:
LACK OF COMPREHENSIVE SECURITY COVERAGE

As mentioned in the preceding sections, though a detailed security cover has been made available at most of the major railway stations, the peripheral sections leading up to these areas continue to receive scanty security coverage. This view is further bolstered by the fact that some, if not all the incidents involving sabotage have taken place on major routes leading up to these stations. This means well-coordinated attacks along these major routes leading up to the stations holds sufficient potential to significantly disrupt the railway services. Issues of congestion at major railway stations, faulty or unmanned Access Control, Personal and Baggage Screening System also continues to be a source of concern.

INTER-SERVICE OPERABILITY ISSUES

As per the Comptroller and Auditor General of India (CAG) report, there continues to be lack of inter-services coordination tasked with securing the railway installations. The IR failed to redeploy man power prioritizing core operations which could have reduced the requirement of additional manpower.

SHORT STAFFED AND LACK OF ADHERENCE TO SOP’S

Both the IR and the State Governments did not respond promptly in filling up the existing vacancies for meeting the challenge of increased security threat. Railways were reluctant to outsource security even in non-core areas to private agencies. The existing training facilities were frequently underutilized.

CONCLUSION

Train derailments prospectively remain an emerging form of terrorist tactic in India. With large portions of India’s rail network left unmonitored, the simplistic methods required to carry out a successful train derailment operation, challenge security measures, putting the emphasis on proactive intelligence and quick response.

Despite a sizable chunk of the railway budget being allotted to enhance security measures, the issues concerning security of railway infrastructure in general and rail tracks, in particular, continues to be a pressing challenge. Moreover, the latest uptick in the fatalities caused by rail derailments, a some of which have been attributed to incidents of sabotage further highlights the existing vulnerabilities. The simple yet effective modus operandi employed in targeting the railways makes it increasingly difficult to differentiate an act of sabotage possibly carried out by anti-social elements or criminal gangs from that of a militant attack.

Finally, despite these challenges, the adopted SOP’s have proved effective in bringing down the accidents caused due to technical and infrastructural issues, yet less effective to counter incidents of sabotage, which continue to plague railway operations. As such, India’s railway security will draw upon the focus of the Government of India and security professionals worldwide for the foreseeable future.
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