



## Response to South Central Railways

S.No.	Summary of Objections / Suggestions	Response of the Licensee
1.	<p>Inherent design of the latest Electric Locomotives with regenerative braking: Modern electric locomotives are equipped with regenerative braking systems, whereby electrical energy generated during braking is injected back into the grid, particularly during off-peak/low traction load conditions.</p>	<p>TGDISCOMs acknowledge that electric locomotives use regenerative braking systems</p>
2.	<p>Power flow at the interface shall be bi-directional: The drawal entity (RailwayTSS) is connected to the Intra-State Transmission System, and power flow at the interface shall be reversible due to regenerative braking.</p> <p>Thus, power flow at the TSS interface point is inherently bidirectional in nature.</p> <p>In the state of Telangana, out of the total 31 Railway Traction Substations over S.C. Railway, in 14 Railway Traction Substations, DISCOMs have installed unidirectional energy meters instead of bidirectional/ABT-compliant interface meters and at 17 Railway Traction Substations, bidirectional meters provided but they are made to function as unidirectional meters.</p>	<p>The interface metering point covers a long section of the railway traction network, extending over several kilometers. Within this section, multiple locomotives and rakes operate simultaneously. While one locomotive may generate energy during braking, other locomotives within the same traction zone are simultaneously drawing power for traction requirements.</p> <p>The regenerative energy produced during braking is first utilized within the railway system itself, including:</p> <ul style="list-style-type: none"> <li>• Auxiliary consumption of the same locomotive (compressors, blowers, control systems, etc.).</li> <li>• On-board auxiliary loads of AC coaches such as HVAC systems.</li> <li>• Other rolling stock operating in the same electrical section drawing traction power.</li> </ul>

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3.	<p>The issues with unidirectional meters:</p> <p>a) Energy exported (regenerative energy) from Railways to the grid is not recorded.</p> <p>b) Only import energy is measured.</p> <p>c) Net energy accounting is not carried out.</p> <p>d) No tariff or settlement mechanism is applied for exported energy.</p> <p>e) This results in complete non-recognition of legitimate energy injected into the grid.</p>	<p>It is submitted that:</p> <p>Indian Railways' 25 kV AC traction system (as adopted by Indian Railways) is generally fed from the 132 kV / 220 kV grid through a single-phase Traction Transformer connected between two phases (R-Y or Y-B) of a 3-phase system.</p> <ul style="list-style-type: none"> <li>• Primary winding: Phase-to-Phase (Line-to-Line)</li> <li>• Secondary winding: 25 kV single-phase feeding OHE (Overhead Equipment)</li> <li>• Load type: Highly fluctuating, moving load (locomotives)</li> </ul> <p>Thus, although the DISCOM grid is fundamentally 3-phase balanced, the traction load imposed is single-phase in nature.</p> <p>When the traction transformer primary is connected between two phases (e.g., R and Y):</p> <ul style="list-style-type: none"> <li>• Current IR flows from phase R into the transformer.</li> <li>• Current IY returns through phase Y.</li> <li>• Phase B carries no current contribution for that traction</li> </ul>

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		<p>transformer.</p> <p>In instantaneous terms:</p> <p><math>I_R = -I_Y</math> (for single-phase load between R and Y)</p> <p>This means:</p> <ul style="list-style-type: none"> <li>• Equal magnitude current flows in two phases.</li> <li>• Third phase remains unloaded (from that traction point).</li> </ul> <p>In the conventional sense, this is not “reverse power export”, from the system perspective one phase carries current in opposite direction relative to the other, creating asymmetrical phase loading at the upstream 3-phase transformer.</p> <p>Due to the aforementioned reasons, bi-directional meter cannot be installed.</p>
4.	<p>Non-installation of ABT Meters Despite Payment made with TGTRANSCO. Railways submit that:</p> <p>a) Necessary charges for installation of ABT-compliant interface meters have already been paid to TG TRANSCO.</p>	<p>TGDISCOMs are processing the request of Railways as per Standard Operating Procedures of TGDISCOMs.</p>

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	<p>b) However, ABT-compliant bidirectional meters have not been installed at 14 Railway Traction Substations interface points, instead, unidirectional meters have been provided.</p> <p>Failure to install ABT meters defeats the purpose of interface metering under Availability Based Tariff (ABT) principles and causes financial prejudice to Railways.</p>	
5.	<p>Non-Grant of NOC for Open Access: Railways have applied for NOC to avail power as'drawee entity connected with intrastate transmission system' as per CERC GNA Regulations -2022 on 1 7.06.2025 with TGTRANSCO.</p> <p>a) NOC for Open Access has not been granted by TGTRANSCO to Railways.</p> <p>b) This is despite the regulatory framework under CERC (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022, which mandate transparent connectivity, scheduling, and accounting principles for transmission-connected entities.</p> <p>c) Interface metering must record actual bidirectional energy flow.</p>	<p>TGDISCOMs are processing the request of Railways as per Standard Operating Procedures of TGDISCOMs.</p>

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	<p>d) Denial of NOC coupled with non-installation of ABT meters results in regulatory and financial disadvantage to Railways.</p> <p>The combined effect of non grant of Open Access and absence of ABT metering affecting procurement flexibility and prevents transparent energy accounting and fair settlement.</p>	
6.	<p>Forced Undertaking by DISCOM: In one of the Traction Substations, DISCOM has insisted that Railways furnish an undertaking stating that Railways will not claim compensation or credit for regenerative energy injected into the grid as a pre-condition for extending supply.</p> <p>Such insistence:</p> <p>a) Is an arbitrary and unilateral.</p> <p>b) Has no statutory backing under the Electricity Act, 2003.</p> <p>c) Defeats the principle of fair energy accounting.</p> <p>d) Discourages energy-efficient technologies like regenerative braking.</p>	<p>Due to the aforementioned reasons, there is no possibility of exporting energy.</p>

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7.	<p>Regulatory Principles Involved: As per established electricity regulatory and grid operation principles:</p> <p>a) Interface metering at EHT/HT levels must be bidirectional where power flow is reversible.</p> <p>b) ABT-compliant meters are required at transmission interconnection points.</p> <p>c) Energy accounting must reflect both import and export.</p> <p>d) Suppression or non-recording of export energy is contrary to grid discipline and transparency norms.</p> <p>Interface metering must reflect actual bidirectional energy flow as per established metering and grid operation principles. Railway Traction Substations, being bulk HT/EHT consumers connected to the grid, qualify for proper interface metering , consistent with ABT principles.</p>	<p>As per CEA metering regulations section 7</p> <p>“(a) Interface Meters</p> <p>(i) Consumers who have interconnection with the Inter-State Transmission System or Intra-State Transmission System and have been permitted open access by the Appropriate Commission shall be provided with interface meters.</p> <p>(ii) For consumers connected to distribution system and permitted open access, provision of interface meters may be made as per the regulations or directions of the Appropriate Commission.</p> <p>(iii) The scheme for location of interface meters shall be submitted to the CTU or the STU or the licensee by owner of the meter in advance, before the installation of the scheme.”</p> <p>Hence, the meters installed to railway services need not be interface meters.</p>
8.	<p>Prayer to the Hon'ble Commission:</p> <p>Railways respectfully request the Hon'ble Commission to:</p> <p>a) Direct TGTRANSCO / TGDISCOMS to immediately install ABT-compliant bidirectional interface meters at all Railway TSS and GSS locations.</p> <p>b) Ensure proper accounting of both import and export energy.</p>	<p>TGDISCOMS have responded to all the comments by the SCR and would like to reiterate that net energy accounting is not applicable to Railway traction connections and No tariff settlement for exported units is admissible</p>

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	<p>c) Direct billing to be carried out on net energy basis.</p> <p>d) Artificial suppression of export data is contrary to grid discipline.</p> <p>e) Unaccountable regenerative energy system affects, Energy efficiency incentives and Decarbonization objectives of the nation.</p> <p>f) Non-recognition of such injection defeats national energy efficiency goals.</p> <p>g) Direct DISCOMs not to insist on any undertaking denying legitimate export claims.</p> <p>h) Issue appropriate directions regarding grant of Open Access NOC in accordance with statutory provisions.</p>	
9.	<p>Conclusion</p> <ul style="list-style-type: none"> <li>• Railways are injecting regenerative energy into the State Grid without recognition due to unidirectional metering arrangements, despite payment for ABT meters and established system connectivity.</li> <li>• The present situation is technically unsound, financially inequitable, and contrary to grid operation principles and regulatory intent.</li> </ul>	<p>TGDISCOMs would like to submit that all billing, metering, and energy accounting practices are strictly in accordance with the provisions stipulated by the Regulatory Commission and the Central Electricity Authority (CEA). These regulations are uniformly applied not only to Railway traction connections but to all categories of consumers without exception.</p>

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	<ul style="list-style-type: none"> <li>• The matter is therefore placed before the Hon'ble Commission for urgent regulatory intervention.</li> </ul> <p>In view of the facts and technical submissions placed on record, the Hon'ble Commission is most respectfully prayed to admit and consider the above additional objections of the Railways in the true spirit of regulatory fairness and grid operation principles, and to grant appropriate relief by setting aside the unwarranted financial burden arising on this account.</p> <p>The Railways, being a strategic public utility with inherent technical contribution to grid stability, may kindly be extended equitable regulatory consideration.</p> <p>Submitted for the kind consideration and appropriate orders of the Hon'ble Commission.</p>	